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JANUARY
1950

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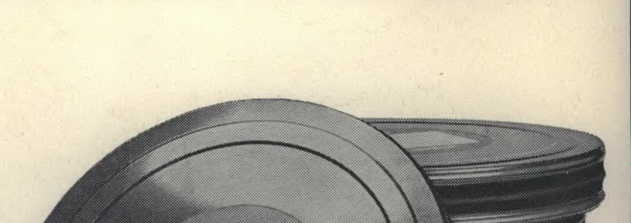

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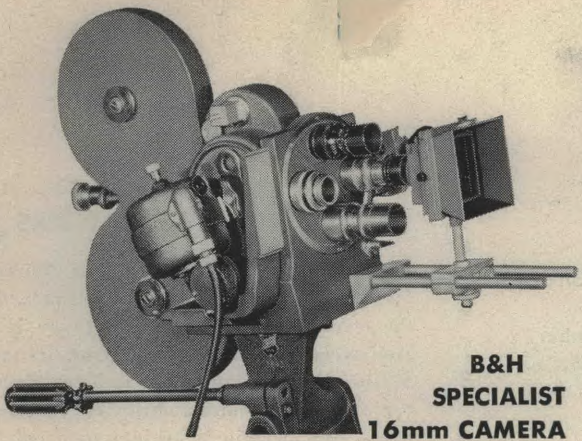

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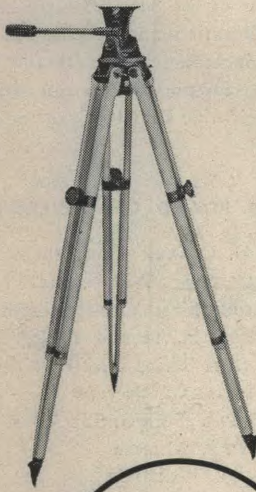

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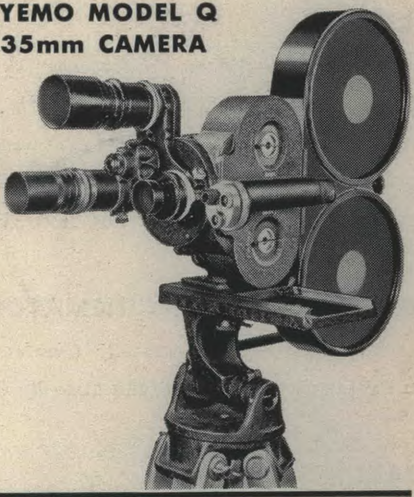

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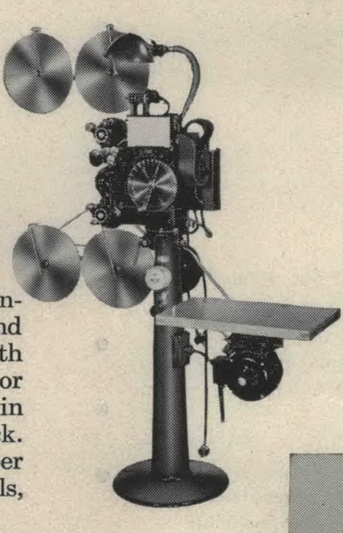

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Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY

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CONTENTS

ARTICLES

Economy Lighting With Photofloods—*By Frederick Foster* . . . 10
Carbon Arc Studio Lighting—*By W. W. Lozier* 11
The Production Of Films For Television 12
Rating Color Temperature—*By Captain Don Norwood* 13
New Multiple Sound Track For 16mm. Films—*By Leigh Allen* . . 14

16MM. AND 8MM. CINEMATOGRAPHY

Lighting For Color Movies—*By Charles Loring* 16
An Experiment In Film Technique—*By Clifford L. Tierney, Jr.* . . 18

FEATURES

Keeping Up With Photography 6
Hollywood Bulletin Board 8
Roster Of Society Of American Cinematographers 22
Current Assignments Of A.S.C. Members 30
What's New In Equipment, Accessories, Service 32

ON THE COVER

Curious bear cubs climb over cameraman Joe Rothberg of Dekko Films, Boston, as he tries for some closeup shots with his Eyemo camera for Bob Emery's "Small Fry Club" television show. Zekalin Walsh keeps the cubs interested in the proceedings by feeding them honey, getting some in Rothberg's hair, which attracted the cub seen nuzzling him affectionately.

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★

AMERICAN SOCIETY OF CINEMATOGRAPHERS

FOUNDED January 8, 1919, The American Society of Cinematographers is composed of the leading directors of photography in the Hollywood motion picture studios. Its membership also includes non-resident cinematographers and cinematographers in foreign lands. Membership is by invitation only.

The Society meets regularly once a month at its clubhouse at 1782 North Orange Drive, in the heart of Hollywood. On November 1, 1920, the Society established its monthly publication "American Cinematographer" which it continues to sponsor and which is now circulated in 62 countries throughout the world.

Dominant aims of the Society are to bring into close confederation and cooperation all leaders in the cinematographic art and science and to strive for pre-eminence in artistic perfection and scientific knowledge of the art.

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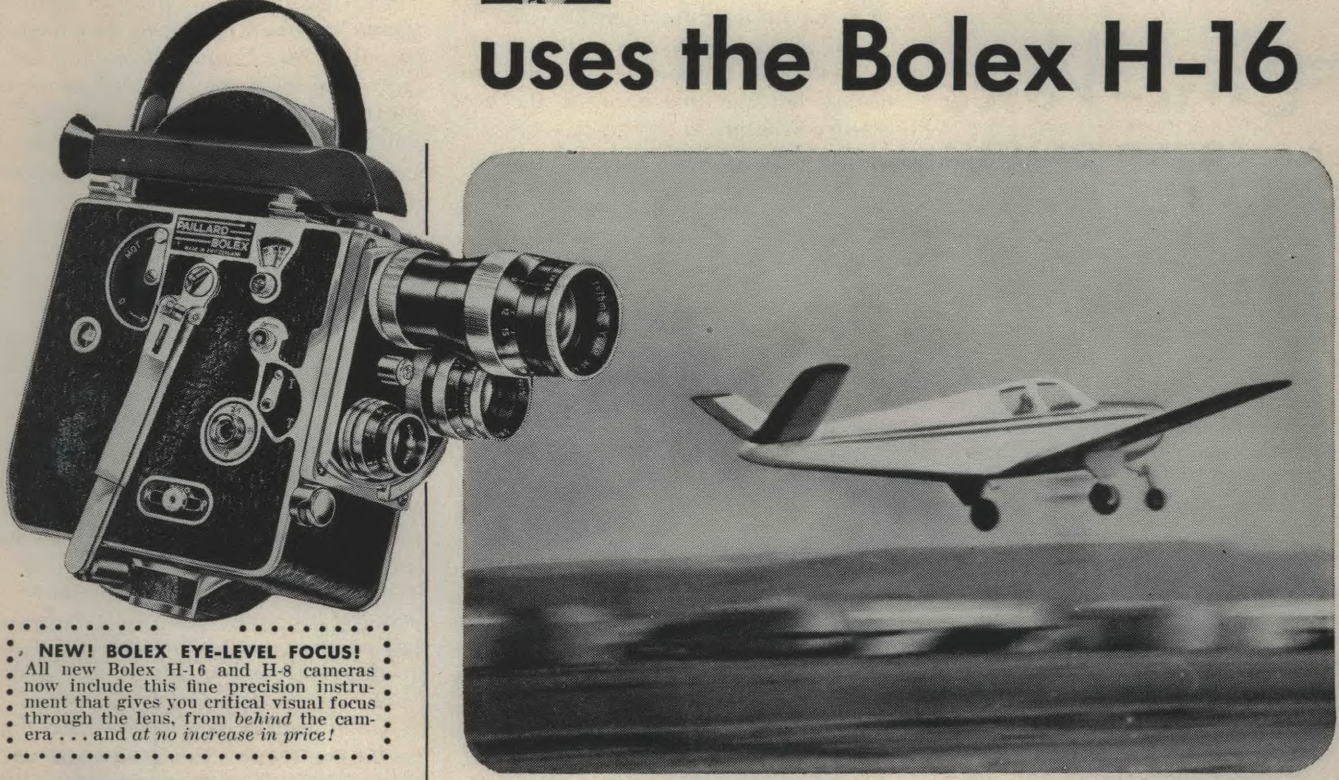
★ ★ ★ ★ AMERICA'S FOREMOST CAMERAMEN PREFER THE BOLEX H-16

Bill Daniels

1948 Academy Award Winner for Cinematography (B&W) on "The Naked City"

uses the Bolex H-16



NEW! BOLEX EYE-LEVEL FOCUS! All new Bolex H-16 and H-8 cameras now include this fine precision instrument that gives you critical visual focus through the lens, from *behind* the camera . . . and *at no increase in price!*

Here's why **BILL DANIELS** prefers the BOLEX H-16

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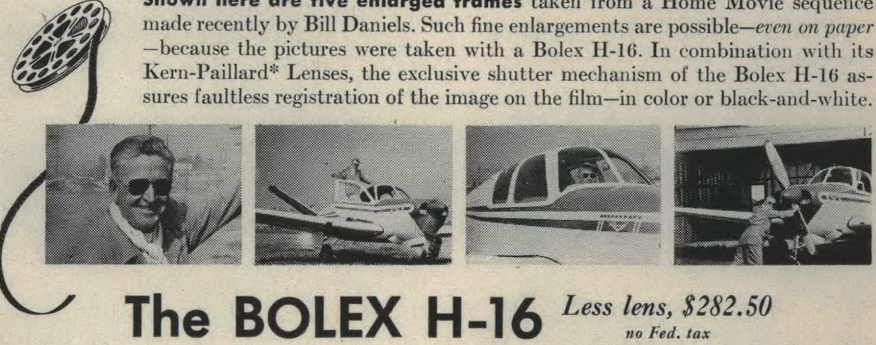
The Bolex is a precision instrument built like the finest Swiss watch by Swiss craftsmen.



Shown here are five enlarged frames taken from a Home Movie sequence made recently by Bill Daniels. Such fine enlargements are possible—*even on paper*—because the pictures were taken with a Bolex H-16. In combination with its Kern-Paillard* Lenses, the exclusive shutter mechanism of the Bolex H-16 assures faultless registration of the image on the film—in color or black-and-white.

The BOLEX H-16 *Less lens, $282.50* *no Fed. tax*

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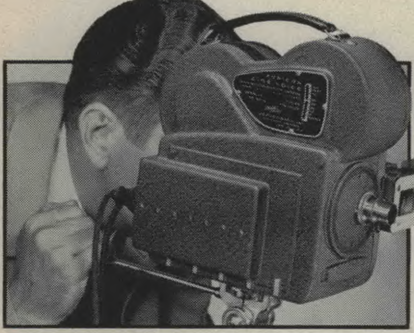

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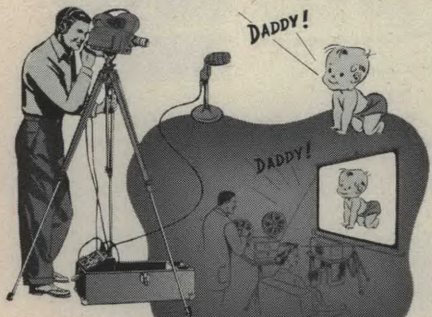
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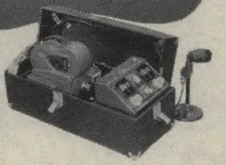

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Keeping up with PHOTOGRAPHY

★ ★

Fifty Years Of Photography

When old Father Time knocked on our door midnight December 31—and aging '49 gave way to newborn '50—not only did another year slip into history but the mid-point of the 20th century arrived.

The date is noteworthy photographically because so much has happened during the first half of this century, and so much more may presumably be expected in the next fifty years.

When the 20th century began, photography was little more than an infant industry, comparatively speaking. Although practical photographic processes had been discovered about 60 years earlier, the business of picture taking was still quite cumbersome, awkward, and unsatisfactory. The simplification of equipment and materials that George Eastman had brought to the photographic process was beginning to make itself felt at the turn of the century, but big view cameras were still favored by serious amateur photographers. And printing papers and methods were as slow and unsatisfactory, by present standards, as the dry plates and films then in use.

At that time the use of photography as a means of education — or a tool of science, business, and industry—was literally unknown. No one dreamed in those days that photography would sometime be used to locate and chart new oil fields, explore the outer reaches of space, track down nuclear fission, or produce new methods of printing and reproduction which would permit the creation of great magazines such as *Life, Look,* and the *Saturday Evening Post.*

The year 1900, as a matter of fact, marked the birth of the first Brownie Camera, and it was not until 1903 that the famous old N-C (or Non-Curling) film was placed on the market by Kodak. Cellulose acetate (or safety) film did not appear until 1909, and the first panchromatic films for motion pictures were not introduced until 1913.

Today we take the life-saving qualities of X-ray film as a matter of course. But although, since 1896, transparent film was used to a limited degree for röntgenray purposes, X-ray film as such was not introduced until 1914. And X-ray intensifying screens, which tremendously increased the useful scope of radiography, weren't marketed until 1923.

In 1923, the first safe process for amateur motion pictures was announced by the Eastman Kodak Company, and by 1928 the first amateur motion pictures were succesfully produced in color and sound movies were being shown professionally. And 8mm. movies did not appear until 1932. Amateur movies received their greatest impetus in 1935 with the introduction of Kodachrome Film.

The progress of photography since the early 30's has been so spectacular that it would be impossible to list all of the developments without getting into a report of booklength dimensions. Truly fine miniature cameras, for example, were developed and rose to heights of astounding popularity. The twin-lens reflex camera was perfected and has become one of the most popular of all picture-taking outfits.

Color photography and picture taking have grown spectacularly. At the beginning of the century all photography was black-and-white. Today the vast majority of all amateur movies and a substantial percentage of all professional motion pictures are being made in color. And the use of color is growing steadily in both professional and amateur still photography.

Color print-making has been developed to the point where color prints are within the range of everyone and simplified color print-making techniques such as the Kodak Dye Transfer Process and the Kodak Flexichrome Process have replaced the involved and cumbersome methods previously employed.

Lens coating, built-in flash synchronization, and new types of rare-element optical glass have been devised to improve present equipment and make new and better equipment possible. A steady stream of new developments seems assured and inevitable.

What will the future bring? Nobody knows. But photography, like all other sciences, arts, and professions, is certain to continue its development. And, probably, at an even more rapid rate than in the past.

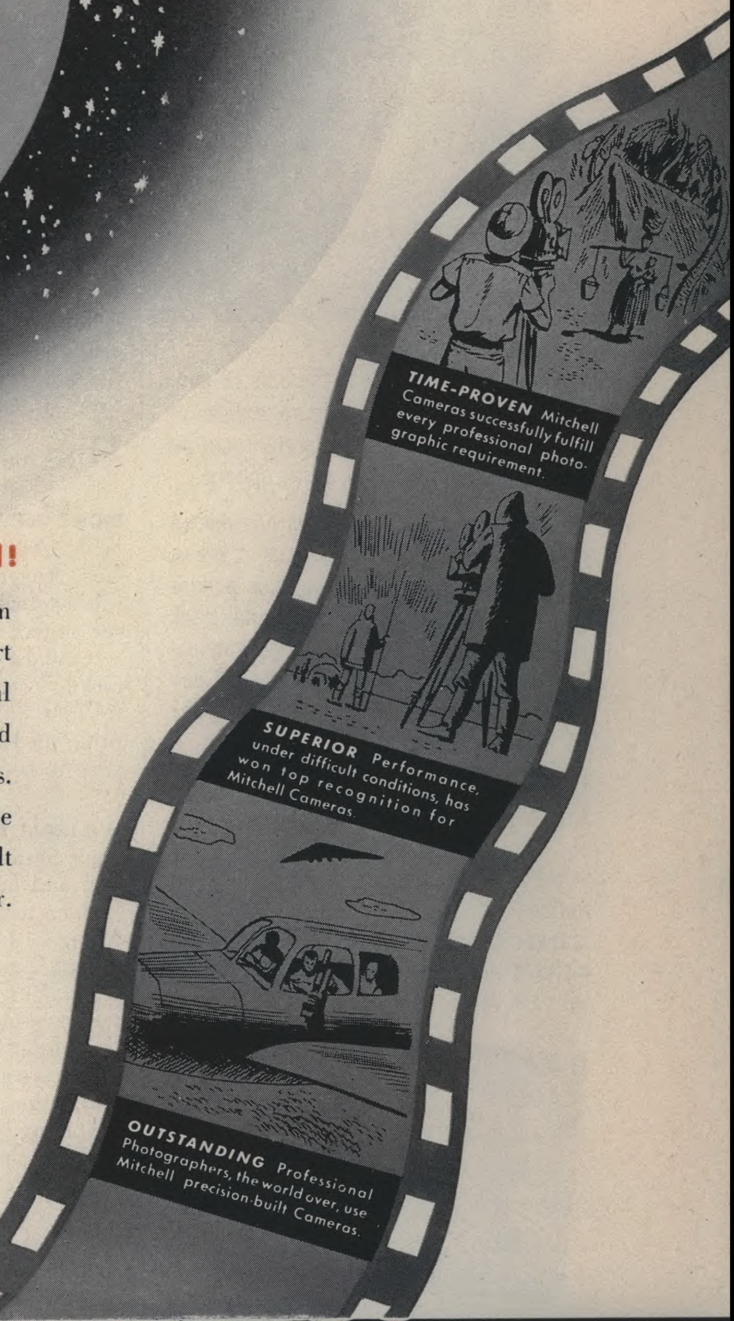
Here's to photography and the next half-century! It should be an interesting era.

●

Mercury Arc Lamp

Light intensities of 90,000 candles per square centimeter are reached at a maximum brilliance with the new Huggins Ames Type-A mercury arc lamp which is used for light source in high speed cinematography. Cooling of lamp is accomplished with ordinary tap water.

Mitchell* known 'round the world proven 'round the world


TIME-PROVEN Mitchell Cameras successfully fulfill every professional photographic requirement.

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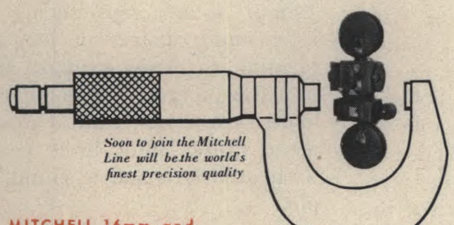
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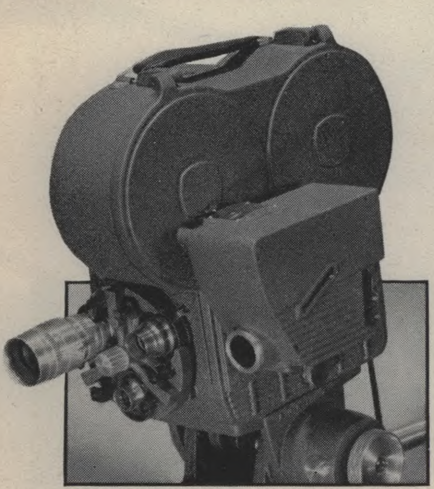
* 85% of the motion pictures shown in theatres throughout the world are filmed with a Mitchell

We have often been asked...



...why the Auricon-Pro is the only 16 mm. sound-on-film Camera made, regardless of price, which operates so silently it can be used within 10 inches of a microphone.

We have been asked how it is possible to sell a 16 mm. "talking picture" Camera which takes a rock-steady, in-focus picture and records a "high-fidelity" sound track on the same film at the same time, complete with amplifier for $1191.00 on a 30 day money-back guarantee and a 1 year service guarantee.

The answer is found in 18 years of specialized production experience with 16 mm sound-on-film equipment, plus world wide sales. Owners and Dealers call Auricon "the best camera value on the market today." Also available to take pictures without sound, if desired, for use with the Auricon double-system Recorder.

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Hollywood
Bulletin Board

JOHN DORED, A. S. C., Paramount News cameraman, has been assigned a new field of operations—covering news events in Scandinavian countries—with headquarters in Halden, Norway.

●

RKO STUDIO, during 1950, will produce or distribute films made in four different color processes. Studio, which has stuck pretty close to black and white film in the past, will have on its schedule this year films made in Technicolor, Ansco Color, Cinecolor and Truecolor.

●

NATIVE CINEMATOGRAPHERS of India will see in use the first camera boom ever put into operation there when Ken L. McEldowney, brings to India this month a Hollywood studio boom and a half-million dollars worth of camera and lighting equipment to aid in the production of "The River." Claude Renoir, brother of Jean Renoir, producer,director, has the camera assignment.

●

EIGHT MILLIMETER movie films are now being televised over station KFI - TV, Los Angeles. Studio engineers accomplished feat by working out a new shutter system and method of synchronizing a standard 8mm. projector with the TV pickup system. At present 8mm. films are telecast only on a special home movies program but use of narrow film may extend to commercials and animated titles.

●

WILLIAM DANIELS, A. S. C., to show his appreciation for the cooperation given him and his Hollywood camera crew by Italian technicians, who worked on the foreign shooting of Universal's "Deported," gave a dinner in Sienna for the crew after winding up the picture. After the two-month stay in Italy, Daniels thought it would be appropriate to celebrate with the men who had helped make the production an enjoyable undertaking. But he failed to consider the Italian's habit of bringing along members of his family whenever invited to a social function. Came tab - picking - up time and Daniels found himself with a guest list—and a food and drink bill—for 32!

●

JOHN ARNOLD, A. S. C., head of the MGM camera department, will soon unveil a radically new camera car said to insure rock steady photography of chase scenes and travel shots over any kind of terrain.

MARY PICKFORD, speaking at the dedicatory ceremony which opened the George Eastman House in Rochester, New York, in November, credited Charles Rosher, who was her personal cameraman for many years, with the first use of artificial light for booster illumination on outdoor shots back in the old Lasky Studio days.

●

RED SKELTON, who was honored guest of American Society of Cinematographers at its monthly dinner in Hollywood in December, outlined plans for authoring a new and novel book on photography. Tome would include humorous highlights of the most interesting filming experiences of Hollywood's cameramen.

●

RAY FERNSTROM, A. S.C., has completed shooting "Constant Challenge," a 35mm. industrial film produced in Ansco Color by Hal Roach for Union Oil Company. Production, which chronicles history of oil company, utilized over 30,000 feet of Ansco Color and probably widest array of techniques yet employed in an Ansco Color production, including background projection with a single projector, matte shots, and M. B. Paul translucent backings.

●

PARAMOUNT STUDIO has purchased a Mitchell 16mm. Professional camera for use in shooting tests.

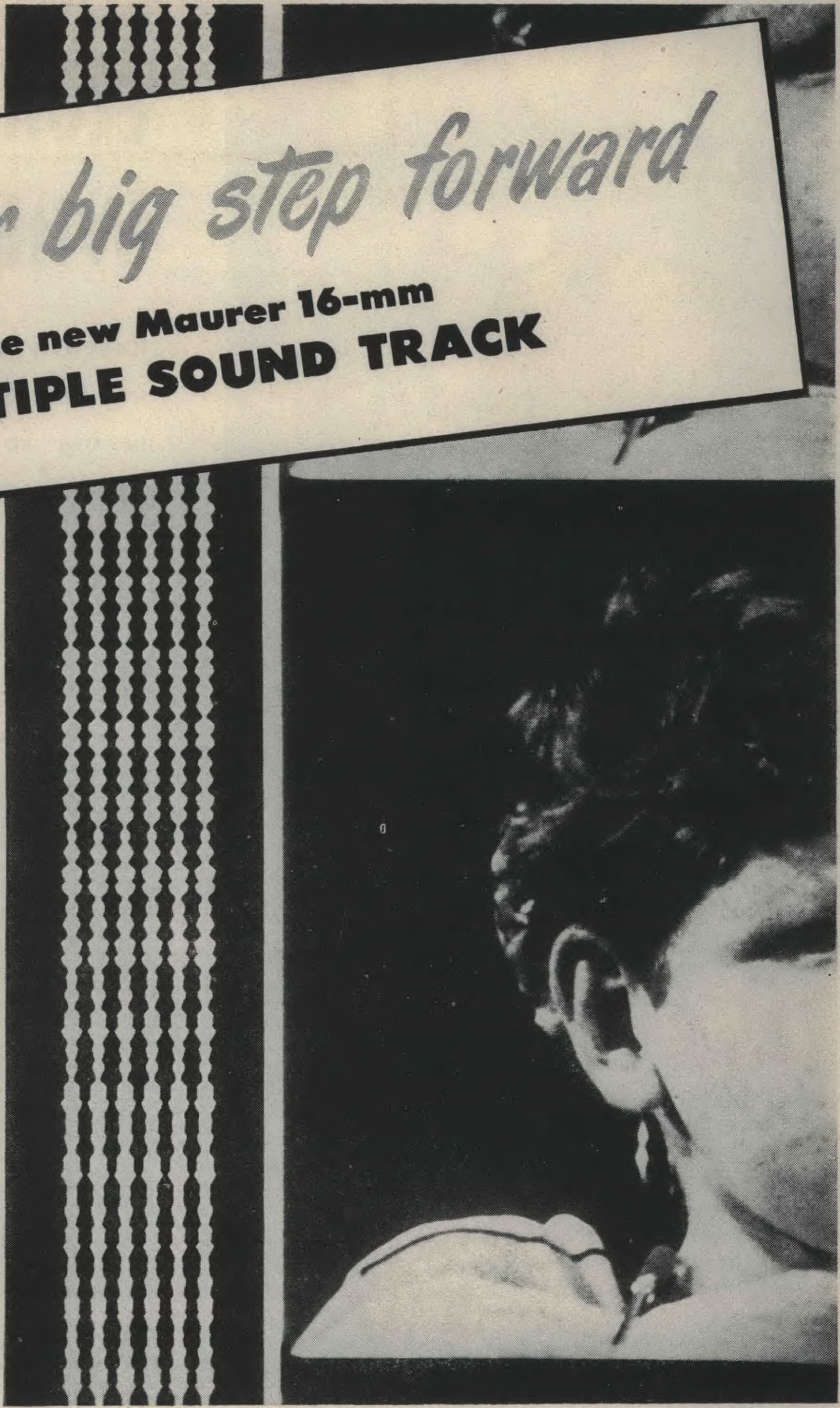
●

MOTION PICTURE Research Council, Inc., announces availability of a new test film to be used as a final listening test of 35mm. sound reproducing equipment. Five hundred feet in length and conforming to ASA standard Z22.60, test film has picture and sound consisting of main title music, four dialogue samples, piano music, high level vocal selection with orchestra and a sound effects sample.

A 16mm. version, which conforms to proposed American Standard Z22.79 and replaces 16mm. Sound Projector Test Film Z52.2, is also available. These and other types of test film for 16mm. and 35mm. sound equipment are available from the Motion Picture Research Council, 1421 North Western Avenue, Hollywood, and from the Society of Motion Picture Engineers, 342 Madison Avenue, New York 17, New York.

Another big step forward

the new Maurer 16-mm
MULTIPLE SOUND TRACK



A very substantial improvement in sound reproduction in the average projector is possible with this new type of 16mm. sound track.

The Maurer multiple track replaces the ordinary single track with a group of six within the same area. All of the six tracks are identical, so that any possible lack of uniformity in the projector scanning beam will be minimized.

16mm. producers in all fields will welcome this advance for two excellent reasons. First, it means better reproduction of their prints wherever they are run in the field and, second, the new track may be recorded perfectly without changing the familiar technique which Maurer recording equipment has already brought to the industry. The new track is equally advantageous with black and white or color and may be processed and printed by the same techniques as in the past.

Advantages of the new track, while readily demonstrable by intermodulation distortion measurements, are generally apparent on simple playback; it *sounds* better on the average projector.

The new Maurer Recording System, incorporating the six-track galvanometer, will be commercially available early next year.

In line with the Maurer policy of protecting its customers against obsolesence as far as is possible, all owners of the Maurer Model E System will be invited to convert their equipment to the new six-track recording, at a cost which will not exceed the difference between the initial costs of the two systems.

16mm maurer

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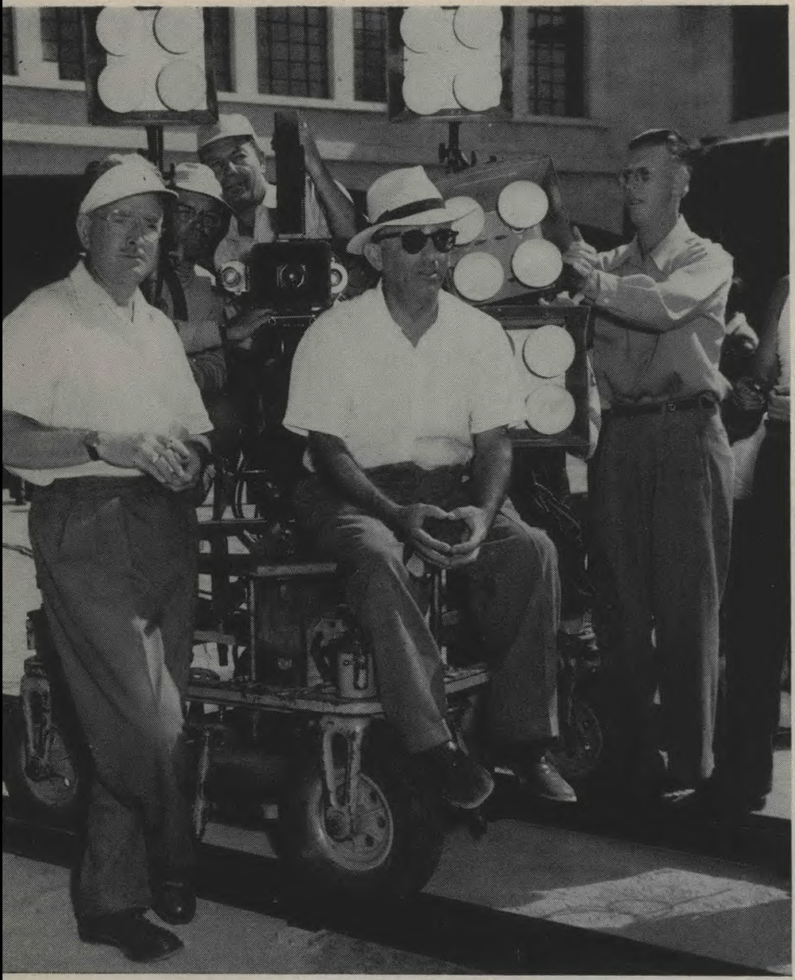
16-mm Professional Production Equipment



PHOTOFLOODS—lamps originally designed for amateur photographers —found new status as a professional lighting tool in the production, "Deported," filmed in Italy. Here clusters of RFL-2's are shown supplying fill light for an exterior shot filmed in Sienna by William Daniels, A.S.C., (left) and his crew as Director Robert Siodmak looks on.

Economy Lighting With Photofloods

Recently developed 'quad' unit employing four RFL-2's proves time-and-money-saving source of illumination for U-I camera crew shooting on location in Italy.

By FREDERICK FOSTER

ACTUAL THEATRE interior in Sienna, Italy, posed no lighting problem for cinematographer Daniels, who used photofloods entirely to light it, and with excellent results.

PHOTOFLOODS, those incandescent photographic lamps once thought of as a lighting source solely for amateur photographers, have now become a major tool of the professional cinematographer. Used increasingly during the past eighteen months for illumination on locations and to augment regular studio lighting units, more recent developments have established the photoflood as one of the most important adjuncts in the lighting of motion picture sets today.

Perhaps their first practical and widespread use in major film production came in for attention when Director of Photography William Daniels used photofloods in filming scenes for the Academy Award-winning "Naked City" in New York. By this time, Universal-International studio had developed the quad-light, a deep, rectangular pan fitted with porcelain receptacles to accommodate four RFL-2 photoflood lamps. These can be plugged into any 110-volt utility line. When the line is adequately fused, it will provide current for a sufficient number of quads to illuminate the average location interior or stage set. Thus a considerable saving is effected by doing away with the cost of transportation of a generator.

Drawing on his location filming experience in shooting "Naked City," Daniels recently completed photography in Italy of the greater part of Universal-International's "Deported," in which photofloods played a dominant part both in the illumination of interior and exterior sets and in effecting marked economies in production costs.

The economy side was pointed up by Daniels who contrasted the 32 hours that was required to transport to Italy by air the compact photoflood illumination units used for "Deported" against the fourteen days that were required in transporting lighting equipment used in shooting "Ben Hur" in Italy several years ago. What amounted to virtually a trunk full of photoflood lamps and another trunk of collapsible portable standards to hold them, enabled Daniels to wind up shooting of "Deported" under budget and under schedule. His company shipped no heavy lighting equipment from Hollywood except a couple of war-surplus army searchlight generators which furnished power when local utility lines were unavailable. One such generator provided sufficient power to light twelve four-lamp quad units—forty-eight photofloods in all.

Because of their portability and the ease with which they can be handled, the quads were used to supply fill light in exteriors shot in sunlight in place of reflectors. "There were a great many scenes," said Daniels, "in which the action was staged in deeply shaded locales, and in each case we used photofloods entirely for the illumination." One of the accompanying photos shows such a scene staged on a sidewalk cafe in Sienna, Italy, shaded by a deep, overhanging canopy. Ample use of photofloods here gave the illusion of normal daylight.

One of the most interesting interior sequences was filmed indoors in the auditorium of a little theatre in Sienna. The entire interior was adequately lighted by photofloods arranged on the stage and reflecting light toward the audience—a setting that ordinarily would call for considerable heavy lighting equipment. "Not only were the photofloods ample for lighting the theatre," said Daniels, "but we had to subdue the practical lights, of which there were many, in order to achieve the desired lighting of the auditorium."

When shooting critical interiors where the camera faced windows—essential in many scenes in order to pick up some of the exterior setting outside—Daniels accomplished this successfully by boosting the level of interior lighting to equal that of the exterior. No filters were used on the windows as is so often done when shooting on location in Hollywood. Also, said Daniels, Double-X film was used in shooting these interiors, and this plus the high light level combined to make such shots successful.

Daniels used three kinds of black and white film in shooting the Italian location scenes: (1) Background X for normal

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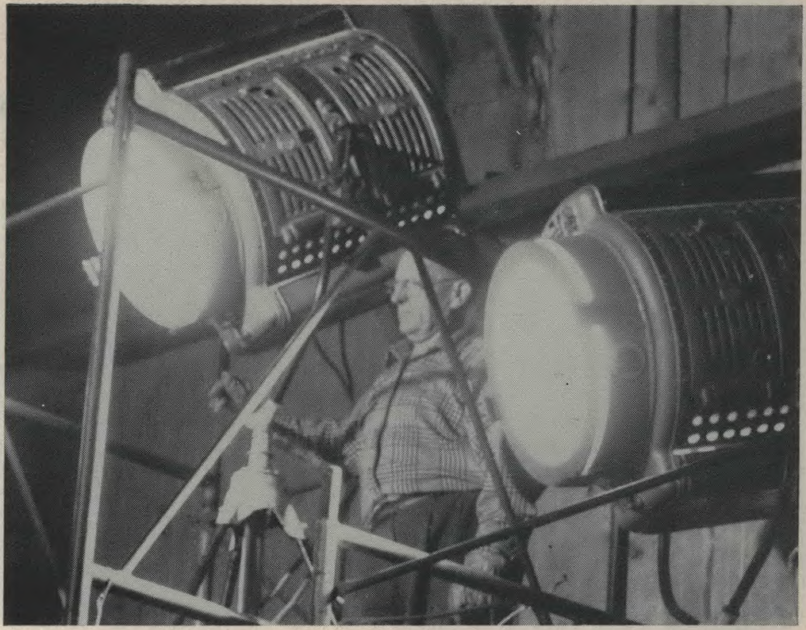
PHOTOFLOODS replaced sunlight reflectors in supplying fill light for many exteriors such as this one made in the shade of a deep canopied sidewalk cafe.



USE OF powerful arc lamps makes it possible to illuminate large sets with reasonable numbers of units and obtain desirable modeling effects and directional control over lighting. Moreover, color of the arc lamp light is ideal for color photography.

Carbon Arc Studio Lighting

By W. W. LOZIER

National Carbon Company, Inc., Fostoria, Ohio.

STUDIO LIGHTING with carbon arcs, except for a brief period when the introduction of sound suddenly outmoded the older equipment and forced the development of quieter units, has been from the beginning a very important factor in motion picture production. Particularly since the introduction of Technicolor with its requirement of a daylight quality light, carbon arc lighting has found increasing favor. In the years following, there has been development of a number of different lamps and associated carbon trims as the need for them was visualized, with the result that carbon arcs are used almost entirely on Technicolor and also have an important place in the lighting of black and white pictures.

The type 90 and the type 170 spot lamps were described by Mole-Richardson in 1936. The improved features of design and construction in these lamps gave them ready acceptance in the studios. Continuous rotation and feeding of the carbons did a better job of maintaining the proper carbon positions during burning and gave steadier and more dependable operation. Careful thought and attention to the problem produced quieter lamps than previously. The adaptation of the Fresnel lens to the carbon arc spot lamp produced a well distributed beam of radiation and gave the desired flexibility and control.

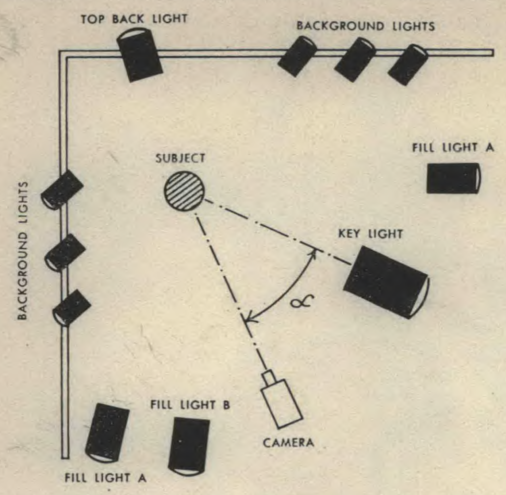
Carbon development projects were carried on coincidental with lamp development. There was a tendency with some of the early spot-lamp carbons for the flame to occasionally flash back on to the shell back of the crater. The disturbance lasted only a fraction of a second but was enough to be observable. After trying many different attacks and burning many hundreds of trims, we were able to develop a carbon which eliminated this difficulty. Then too, after other lamp noises had been quieted down it was observed there was a residual frying noise which was traced to the negative carbon. An intensive research program was carried on with the result that the copper coated motion picture studio negatives were introduced about 1938. These together with lining of the

(Continued on Page 24)

The Production Of Films For Television

Too many motion pictures made for television have not provided good receiver tube image quality. Eastman Kodak set its researchers in quest of answer, now offer recommendations for improved photography of television films.

Condensed from "The Use Of Motion Picture Films In Television," by Eastman Kodak Company



LIGHTING CODE

KEY LIGHT—5000-watt Fresnel placed at angle α (less than 45°) from camera and at higher elevation than camera so as to break shadow between nose and upper lip.

FILL LIGHTS—Diffused, 2000- or 5000-watt Fresnel.
  A. Placed at eye level.
  B. Placed lower than eye level.

TOP BACK LIGHT—Diffused, 2000- or 5000-watt Fresnel.

BACKGROUND LIGHTS—Diffused or not, depending upon dramatic effect desired. 750- or 1000-watt Fresnel, mounted on top of scene flats.

FIGURE 1—Typical studio lighting arrangement.

With their similar modes of expression it is quite natural that motion pictures and television should have mutual interests in presenting a program to the public. Television offers, within limits, immediacy in presenting events as they occur, and this feature is often of vital importance to the success of a program. Much program action must be positive in character and must be properly presented if it is to deliver the intended message. The solution to this problem is to record the action and sound on motion picture film, which may be appropriately cut and edited as is customary in the production of professional motion pictures for other uses. In this way, every action, movement and effect may be advantageously used to achieve realism and to transmit ideas forcefully and in a convincing manner.

The majority of films which have been telecast to date have not provided good receiver tube image quality. Many factors have contributed to this situation, among which may be mentioned the lack of planned production of films for television use, poor photographic quality of prints, bad physical condition of the film, and last but not least—the rapid expansion of television with an enforced low program cost.

Experience has demonstrated that motion picture production with planned procedure and with the use of the proper techniques can give high quality sound films for television use at very nominal cost.

The procedure to be followed in making motion pictures for television purposes is similar to that used for making conventional motion picture productions, with only slight variations from standard techniques. For economic reasons, emphasis should be placed on careful planning and speed, while from the technical standpoint it is important to recognize certain characteristics of the present television system. As in regular motion picture production, the best professional guidance, equipment and technique are to be recommended if successful results are to be obtained. The following recommendations are based on the above considerations.

Camera Equipment—For television studio photography, either 35mm. or 16mm. professional or professional type motion picture cameras operating at the standard sound speed of 24 frames per second or 90 feet per minute (36 feet per minute for 16mm. film) may be used. Whenever synchronized sound is to be recorded as part of the production, cameras must be

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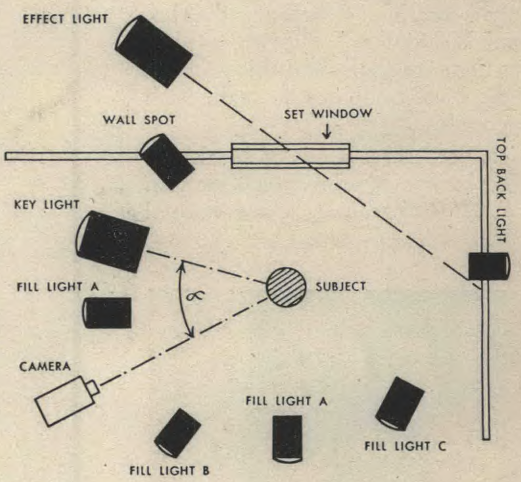

LIGHTING CODE

KEY LIGHT—5000-watt Fresnel placed about 24" above subject's eye level and at angle α (less than 45°) from camera.

FILL LIGHTS—Diffused, soft, 2000-watt Fresnel.
  A. Placed at eye level.
  B. Placed below subject's waistline.
  C. Placed above for background control.

TOP BACK LIGHT—Diffused, 2000-watt Fresnel.

WALL SPOT—Diffused, 2000-watt Fresnel for background control.

EFFECT LIGHT—120-amp. Arc Fresnel for window effect on background.

FIGURE 2—Typical arrangement of lamps for window effect lighting.

Energy (total) under blackbody curve

V (linear sca

7
6
5
4
3
2
1

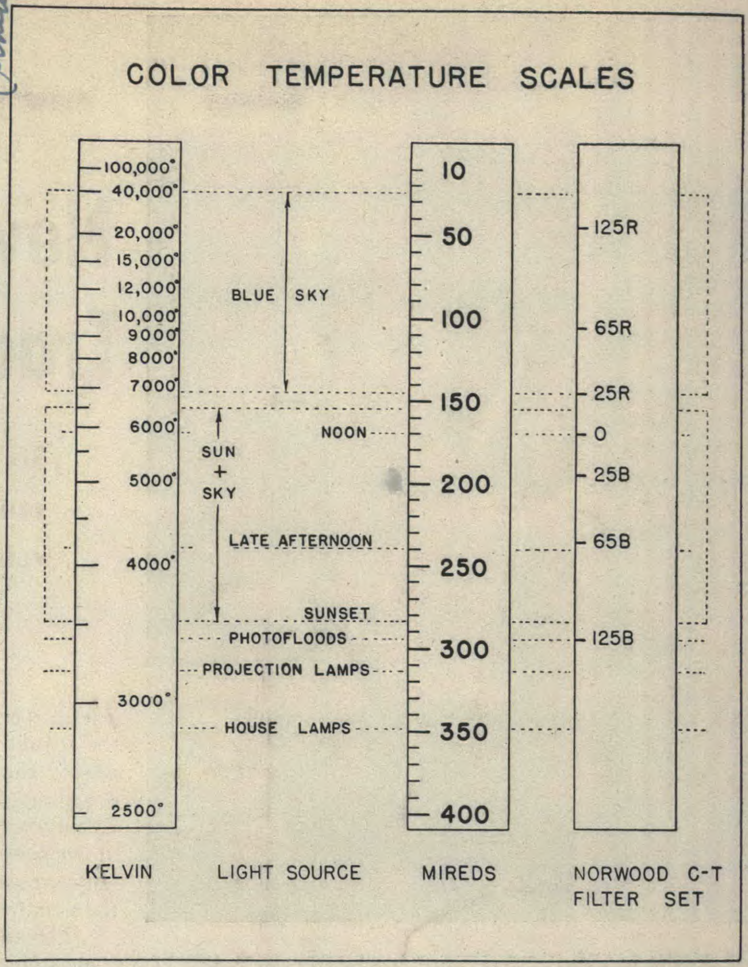

Fig. 1

CHART shows useful range of the "degrees Kelvin" scale and the relative corresponding values of the Mired scale. Also shown are the Mired values for various types of light sources. At far right is the Norwood color temperature scale which indicates the color correction filter to use for a given light color temperature, when used in conjunction with the Norwood color temperature meter.

Rating Color Temperature

Mired scale considered more critical than Kelvin in measuring color temperature.

By CAPTAIN DON NORWOOD

THE COLOR of illumination may have considerable effect on the quality of color pictures. Sometimes the effect is advantageous. At other times it is adverse. In any case it is well for the color filmer to have some control over the matter.

Sometimes, as is the case within studios, the color of the illumination may be controlled at the light source. This may be accomplished by means of voltage change on the lamps, or by the use of gels., or both.

At other times, as is the case with outdoors pictures, control of the light source is not possible, so it is necessary to use color filters of a special type adjacent to the camera lens.

In order that these corrective measures may be appropriately applied, a few points in regard to illumination color may be kept in mind.

The illumination sources with which photographers usually work include the sun, incandescent lights, and carbon arc flames. These light sources all fall into the continuous spectrum classification. They have characteristics such that the balance of colors therein may be classified by a color temperature rating.

A color temperature rating as a means of describing the color of an illuminant was apparently first used by Hyde about 1911. Since that time this method of assigning color temperatures to incandescent bodies has come into general use. The temperature scale used was the absolute or Kelvin scale. Hence the term "degrees Kelvin" or "°K" has become rather general.

The point of most importance to a photographer is that as color temperature changes, the ratio of red component to blue component in the illumination changes. At low color temperatures the red component is predominant. At high color temperatures the blue component is predominant. At an intermediate color temperature the red and blue components just balance. This is the condition found under noonday sunlight plus skylight. It is the condition for which daylight type color film is balanced.

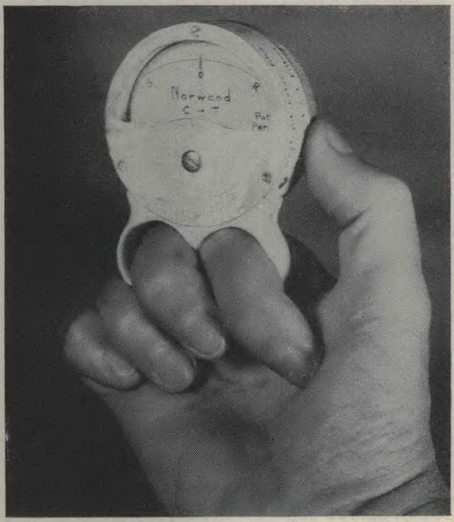

Fig. 2

A FEATURE of the Norwood color temperature meter is the provision for instantly interchangeable scale plates which fit around periphery of meter.

The useful range of a "degrees Kelvin" scale may be seen in Fig. 1. Also shown in Fig. 1 are various illumination sources. The positions of these various sources relative to the Kelvin scale are a matter of some interest.

The Kelvin scale is quite useful for many purposes. However, it does have one serious weakness. A given color difference, such as might be caused by a filter, is not represented by the same number of degrees Kelvin when used at different parts of the scale. For example, a thin blue filter, such as may be used to change color temperature, might have a difference value of 50°K when added to a lamp burning at 2500°K, and a difference value of 3800°K when added to sky light of 20,000°K.

Similarly, a color temperature meter might have an accuracy rating that would be expressed by plus or minus 100°K at

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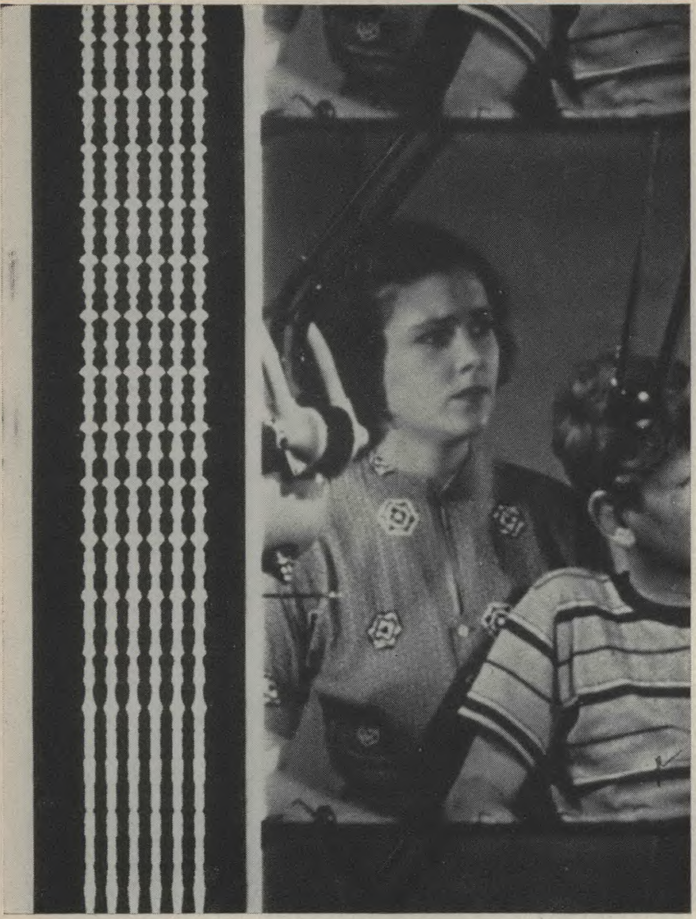


HALF 16MM. FRAME, above, shows six-unit sound track recently introduced by J. A. Maurer, Inc., makers of professional 16mm. cameras and sound recording equipment. All six tracks are identical, so that any lack of uniformity in the projector scanning beam will be minimized.

New Multiple Sound Track for 16mm. Films

Six tracks instead of one increase sound quality; should improve the value of 16mm. films for television.

By LEIGH ALLEN

THE FAMILIAR bilateral type of recording in a single line is replaced by a group of six smaller variable area tracks, each a duplicate of the other and one-sixth the width normally employed in a new system of sound recording introduced by J. A. Maurer, Inc., New York. The multiple track, which contains twelve simultaneously modulated, identical areas marks a major improvement in sound reproduction for 16mm. films.

Of outstanding practical value to producers of 16mm. industrial and television films is the fact that prints incorporating this new track will reproduce with much better fidelity on most 16mm. sound projectors now in use. The result, it is claimed, will be much more uniform reproduction from the point of view of clarity and naturalness because much of the wave-form distortion that occurs with other types of sound tracks is eliminated.

The new Maurer 16mm. multiple track accomplishes this result because of its identical duplication of six complete variable area tracks across the normal width of an ordinary track. Most 16mm. projection equipment now in use does not receive the same careful maintenance which is given professional theatre projectors. As a result, the scanning light beams of the 16mm. projectors depart from perfection in two ways. First, they are not uniformly illuminated from one side of the sound track to the other and, second, they are not correctly adjusted for "azimuth"—that is, for the ideal positioning at an exact right angle to the direction of film travel.

Lack of correct adjustment in either of these respects has a serious effect on the quality of sound reproduction when using the regular track. As a matter of fact, numerous studies made during the past year have revealed that a great many 16mm. projectors in an average state of adjustment introduced from 15 to 30 percent intermodulation distortion because of the lack of accurate adjustment of the two factors mentioned. Eight to ten percent intermodulation distortion is generally considered the maximum permissible in the 35mm. film industry.

The new multiple VA track is said to largely eliminate these sources of distortion. With a group of six identical VA tracks in place of one, a variation even as great as 50% in the illumination in the projector sound-scanning beam will still provide substantially undistorted wave form. This is because the variation over any individual modulated area of the new track is extremely small. Since the total signal reaching the photocell of the projector is the sum of the signals given by six individual tracks, each of which has very low distortion, the total reproduced signal has low distortion. Similarly, the harmonic distortion of wave form due to azimuth error is reduced. Overall intermodulation distortion is brought down to values of the order of five per cent, which is excellent performance. Actual listening tests with the new type of track have shown that the improvement is quite as apparent to the average audience as to the engineer.

Further advantages of the new multiple track are that it is recorded, processed and printed with the same techniques as are now used for single VA tracks using the well known Maurer 16mm. recording equipment and that there is no sacrifice of any desirable quality previously obtainable in the single track. Direct positive or negative tracks may be produced in standard operation and "noise reduction" is fully as effective as it is with the former type of track. It has been found that signal-to-noise ratios in excess of 45 decibels are readily obtainable in regular commercial practice.

Although the multiple track is new to the United States for commercial recording use, the basic idea is not original. As far back as October, 1918, a German patent was issued to E. M. C. Tigerstedt for a sound recording optical system that produced a multiple track. In the United States, patents were issued to S. O. F. A. Berglund in 1926 and 1927 covering methods of producing such tracks and others have, at various times, been experimentally active. However, in at least one well known instance, the track was divided into a considerably

(Continued on Page 28)

Better Pictures
In 1950
Will Be
Photographed
In Black and White
And In Color
With a Wide Range Of
EASTMAN
NEGATIVES

Always
EASTMAN
Always The Best

And—Of Course—
BRULATOUR
SERVICE

C.T.C. filter reduces ~~adds a~~ amt. of light o any wavelength ~~subtracts~~ by a constant fraction.

Rate of Increase of amt of light of any wavelength per °K is inversely proportional to color temperature

or, stated otherwise, a ~~given~~ constant fractional increase in amt. of light of any wavelength per increment of color temp (°K) is inversely proportional to ~~color temp~~ color temp.

$$-\frac{\Delta E_{500}}{E_{500}}$$

$$+\frac{\Delta E}{E} \sim \frac{1}{T}$$

J. E. BRULATOUR, INC.

TIME OF DAY is an important consideration in shooting color out of doors. Shooting a scene like this, in late afternoon when there is an abundance of red in the sunlight, requires careful color temperature reading of the light and use of proper color-correction filter.

Lighting For Color Movies

If you want colors to reproduce faithfully in your color movies, watch the quality as well as intensity of your light source.

By CHARLES LORING

A CAMERAMAN shooting a motion picture in black and white is concerned with light mainly in the quantitative sense. The amount of light reflected from the subject onto the emulsion is of prime importance to him; any other characteristic of that light is secondary. When filming in black and white, the cameraman has great leeway in his use of light. He can mix artificial light with daylight without risk—in fact, it is often only through the grace of this mixture that he is able to photograph certain scenes at all. He can shoot motion picture scenes any time from early morning to late afternoon, and he need be concerned only with whether he has a sufficient intensity of light to make the exposure. Also, he may take separate scenes of a sequence on different days, in different locales, and under different weather conditions, and still achieve a consistent lighting quality in the sequence if the scenes are properly printed.

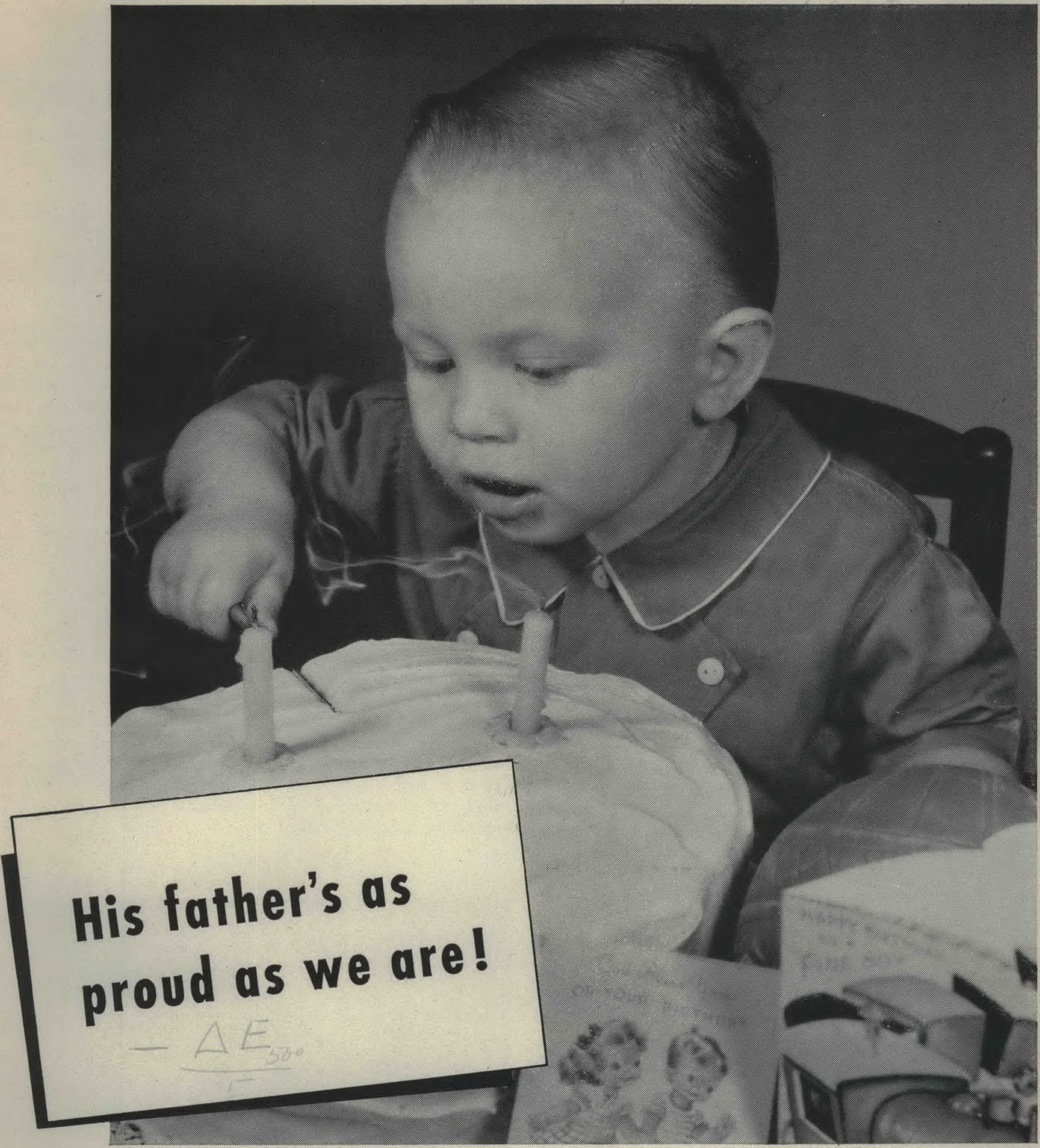
In color filming, all of this is different. The cameraman must worry not only about the amount of light (and this can become a real worry, due to the fact that three or four times as much light is required), but he must also carefully consider the quality of the light which he uses. Whereas in the black and white film, white light is recorded in terms of a grey scale, in color filming "white" light is often anything but white. A dozen or so different variables can give the lighting a color cast which readily becomes a nightmare to the cameraman who is trying to achieve a certain effect, or maintain consistent light quality within a sequence which must be shot under varying conditions.

(Continued on Page 23)

CHIEF ADVANTAGE of shooting color film indoors is that the light can be controlled, and the same lighting setup can be duplicated day after day where shooting must be done at intervals over an extended period of time.

THE LATITUDE of color film is far less than that of black and white, and for this reason light meter readings should be taken carefully before starting to shoot. Basic light reading should be made for flesh tones, as shown here.

C.T.C filter- [illegible] ~~[illegible]~~ a [illegible]



His father's as proud as we are!

$-\frac{\Delta E_{500}}{F}$

THE moving hand. That look of surprise. Even the smoke from the candle. Ansco Triple S Pan stops them all.

But conditions like these are made to order for the terrific speed of this amazing reversible film. It's so fast, in fact, you can use *less* artificial lighting—or you can move your lights *farther* back.

The advantages are tremendous. There is less brilliant glare, which means that children, particularly, are not as conscious of the lights. They are more relaxed. Less apt to squint, or kick up a fuss.

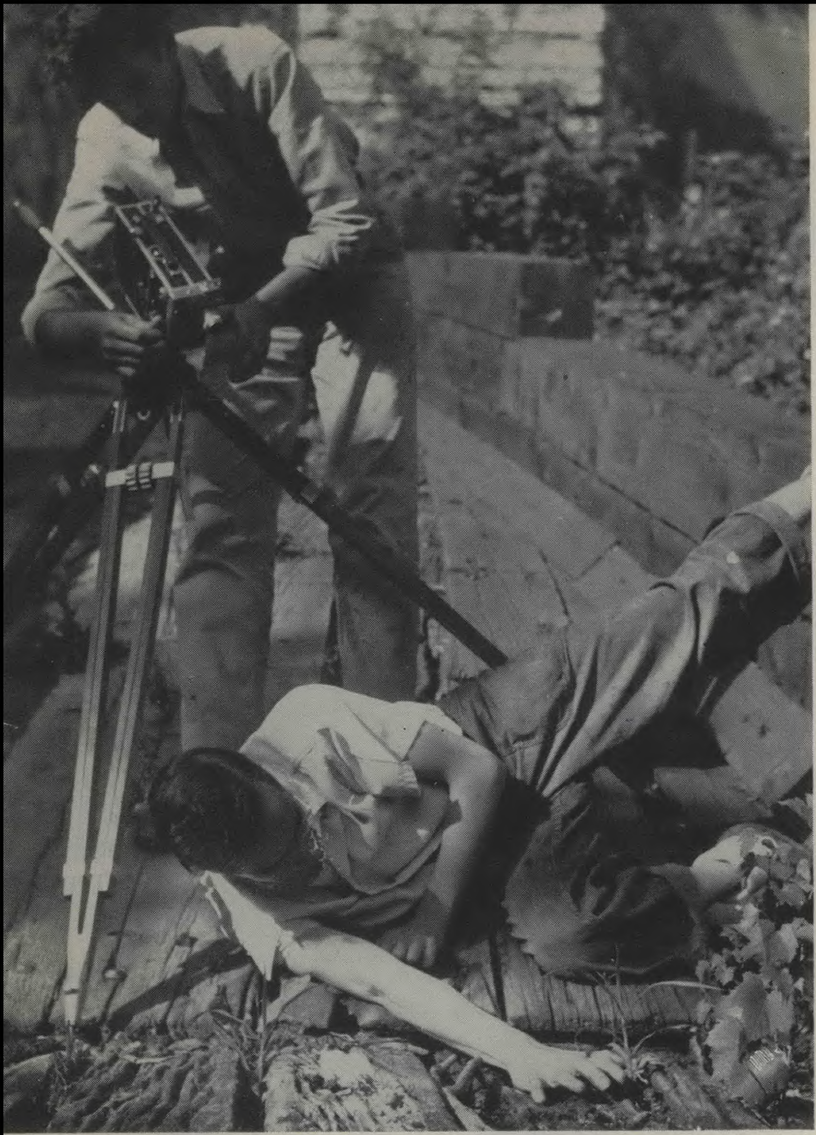
Indoors, or outdoors, Triple S Pan lets you take pictures in relatively poor light; or stop down for extra depth of field. This means you can keep your subject in focus over a much wider range—with needle-sharp screen images.

You'll be delighted, too, to discover the tonal range possible with this wide-latitude film. Get a roll, today, and see how pleasantly surprised you'll be with your "professional" results.

Ansco, Binghamton, New York. A Division of General Aniline & Film Corporation. *"From Research to Reality"!*

ASK FOR *Ansco* 8 AND 16 mm TRIPLE S PAN FILM

An Experiment



CAMERAMAN Mark Doyne and director Gordon Ray prepare to shoot a closeup for "the sequence of life," symbolized by the growing plant, for their 16mm. film, "Out Of The Shadows," an experiment in film technique.

PAINTING, photography, film and television belong to the same realm, that of visual expression. People take part in art for a variety of reasons, and the desire to discover something for one's self has resulted in many great adventures. This longing has led men up the dangerous mountain crags of the Matterhorn and deep into the jungles of Africa. It led a group of us, comprising ciné and art enthusiasts, into a safer though equally stimulating realm—that of the silent motion picture.

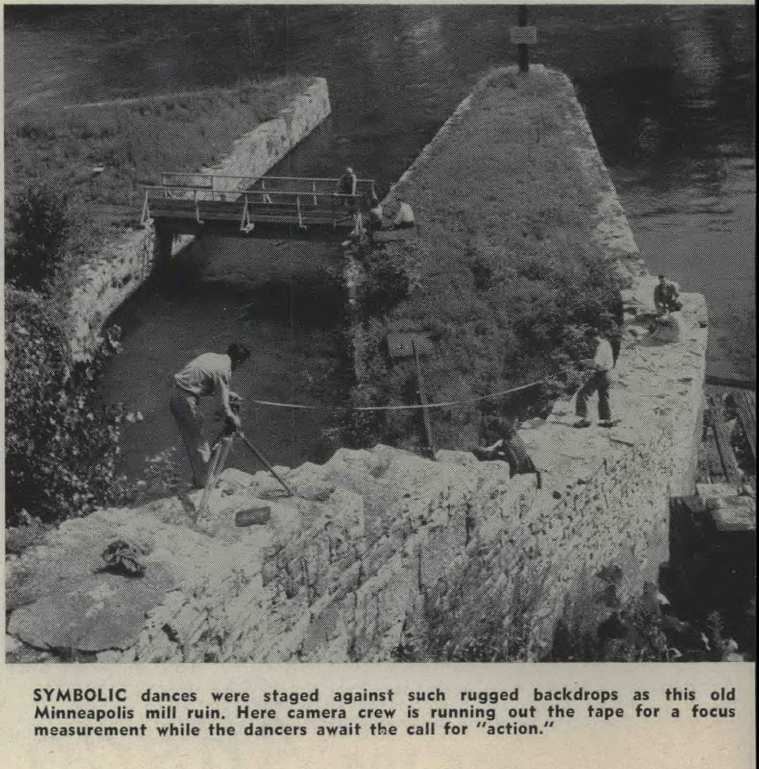
Our "expedition," headed by Gordon Ray, set out to discover and explore some of the possibilities of the screen as an art medium. The expressive modern dance techniques seemed to lend themselves as a possible basis around which to build a theme to carry our ideas. Like all expeditions, ours had its share of disappointments and discoveries. Our first problem was to find those of our associates who wished to explore purely for the love of discovery. We called together all whom we felt might be interested in the venture, and in explaining the plan to them Gordon stressed the problems, difficulties, frustrations, and hard work that the project entailed.

At the close of our pre-production meetings only seven of the original group stayed with the expedition. These were the two camera men, Mark Doyne and Leo Stock; Eunice Brown, a young negro woman, and Anna Leisa Stabb, a German refugee, both students of the modern dance. After considerable discussion with Gordon Ray, who directed the filming, I wrote the shooting script in cooperation with Meg Torbert, an instructor at the University of Minnesota. We had only one objective in mind—exploring the film medium. It was thus hoped that by being free of any axes to grind or philosophies to portray, a fresh and more plastic approach to the screen could be reached. We could let ourselves go, and this it seems is what art is driving at.

Art is lyrical and there is a place for a certain freedom on the screen. We felt that the screen should be free of the restraint of many of the conventional methods and be approached from a different viewpoint. However, the danger involved in such an approach is that the group might seek only after art for art's sake, taking in anything that might fall within the scope of the view finder and calling it the "modern" approach.

To reduce the possibilities of this danger, which has plagued so many explorers in every art form, we attempted to establish some definite conceptions from which we could proceed. As a beginning we took the well blazed trail that Aristotle had beaten for us when he said that "in part, art completes what nature cannot elaborate, and in part it but imitates nature."

With this much established we set out to find a location that suggested a mood, and we hoped to enhance or elaborate on this mood by means of a simple theme interpreted through the modern dance. Several days were spent in searching Minneapolis. Junk yards, parks, industrial areas, and even the city streets were weighed as location possibilities. And strange was the location we chose: on a stretch of river bank where once had stood the old stone mills of St. Anthony. Now long since fallen to ruin, the crumbling foundations were in startling contrast to the sleek new grain elevators that rose on the river bank above. Starkly naked girders extended into space sup-



SYMBOLIC dances were staged against such rugged backdrops as this old Minneapolis mill ruin. Here camera crew is running out the tape for a focus measurement while the dancers await the call for "action."

Film Technique

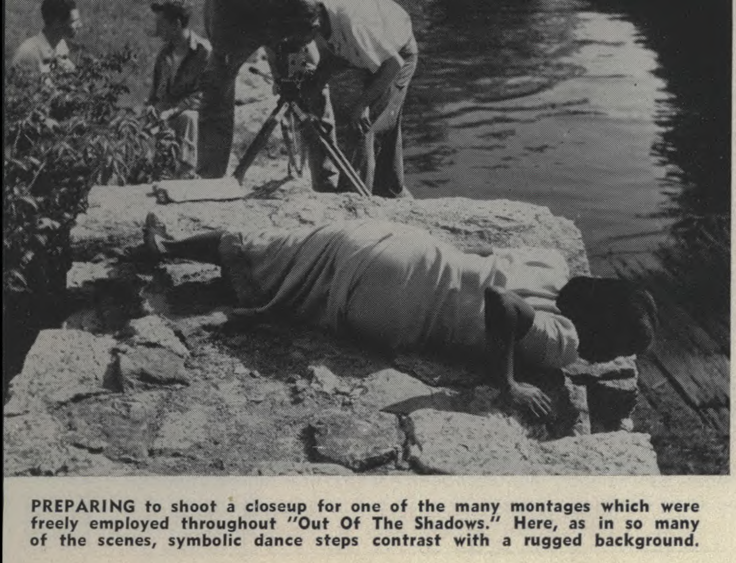
Explorers in cinema art make a safari into the realm of visual expression.

By CLIFFORD L. TIERNEY, JR.

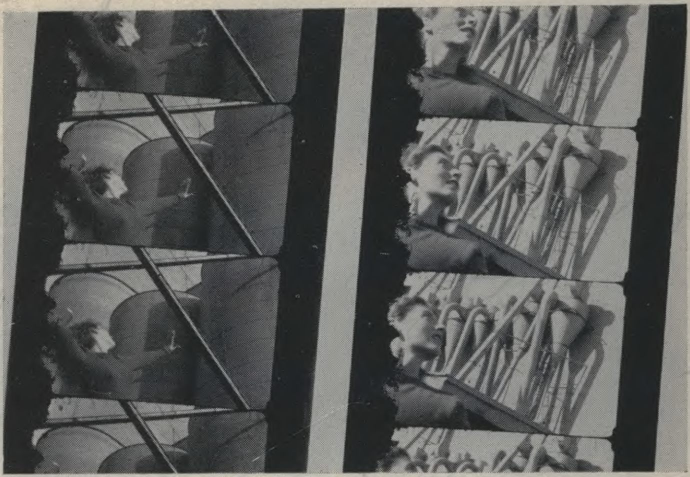
porting nothing, serving only as a lofty roost for an occasional pigeon. Yet all this that should have been silent was made alive by the roar of the water through the flumes and the shouts of the millers from above. Pictorially the ruins did not seem desolate, but a functioning, integral part of the new mills. They seemed a foundation, a support, a producer of the new. This bizarre location suggested the theme for the dancers—*progress.*

We spent a week on the location in preparation before actual filming, absorbing the mood, writing the script, and gathering together necessary equipment. Our camera equipment consisted of a spring motor driven Ciné Kodak Special, with the standard one inch lens, and equipped with 200 foot magazines. A wide angle lens and three inch telephoto lens were used for desired effects in various situations. A Professional Junior tripod was used throughout the filming, and a Weston exposure meter was employed for making light readings.

The filming was done on Eastman plus X negative stock and from this original a work print was made for viewing scenes and for cutting. After seeing the location in various kinds of weather and at different times of day, we felt that the early morning hours expressed most adequately the dominant mood of the locale. The clear, soft light with its long shadows brought out to best advantage the textures in the crumbling ruins. It lent pictorial quality to the dancers' movements, and held the mood of the scenes together as a unified whole. All except two scenes were shot in these early morning hours.



PREPARING to shoot a closeup for one of the many montages which were freely employed throughout "Out Of The Shadows." Here, as in so many of the scenes, symbolic dance steps contrast with a rugged background.



TWO CLIPS from the sequence in which a dancer is shown emerging from the old era to the new — the "new" symbolized by the backdrop of modern industrial vistas.

With all the enthusiasm of seasoned explorers the group was on the location at four-thirty in the morning. Shooting began in the hours immediately after the sun rose. After seeing the first day's rushes we discovered something was radically wrong. The dancers were good in their portrayal of the theme, and the background was in harmony with the dancers. Yet we were left cold. Nowhere had we touched the terrifying grotesqueness that lay in the location. Now the real exploring began. We looked more closely into the possibilities of the medium and experimented with various camera techniques: long dissolves, double and triple exposures, and montages.

The way of finding an art is not always easy. The first scene called for a shot of Anna Leisa on a narrow expanse of wall, weeping. By experimenting with different camera angles and positions and by revising the continuity of the script we changed the beginning, which had left us unsatisfied, to an extreme closeup of the dancer's face as she sat weeping. The camera then panned down to where a tear had splashed in the dust. From this shot of the dust with the still moist tear crater visible a long lap-dissolve of white rushing water covered the screen. A second lap dissolve brought in Eunice's dark hand covered with sea weed which arose from the spot where the tear had been. The scene was made extremely effective by paying particular attention to the rhythm and the interplay of light and dark as it moved through and tied together the scenes. This sequence was shot with the camera speeded up to 64 frames a second, bringing slow motion to the scenes of weeping, the rushing water, and the rising hand, virtually reducing the action to suspended animation.

Thus were the bizarre mood and contrasts of the location keynoted. Large areas of different textures played an important part in the continuity of this sequence. The dark powder-like dust covering the entire screen portrayed the early sterile earth, the white movement of rushing water symbolized time's passing. These and the dark hand of life all conceived through the tear which was as a seed of creation, were made potent by sharp successions of images on the screen.

Throughout the film strong composition, low angles, and a definite atmosphere, played an important role. We soon discovered that the artist must be the one who directs the

(*Continued on Page 33*)

ECONOMY LIGHTING WITH PHOTOFLOODS

(Continued from Page 11)

exteriors, (2) Plus X for night exteriors and normal interiors, and (3), the Double-X stock already cited. The role of each of these films was carefully determined in extensive pre-production tests made in Hollywood, prior to trave'ing to Italy. "It would have been impossible for us to get the results we did," he said, "without the use of three different films and especially if we hadn't made the tests beforehand."

"We had not the benefit of dailies or hand tests," Daniels continued. "We navigated virtually 'blind' the entire time we were in Italy. I had my fingers crossed most of the time. Still I was confident we'd come through alright, in view of prior experience in shooting 'Naked City' in New York, in which I had encountered similar problems, using the same type lighting equipment."

The RFL-2 photoflood lamps have a rated life of six hours. This poses a problem of keeping a check on the lamps to make sure they are not burned beyond this period and thus risk the chance of their blowing out in the midst of a take. Daniels established the practice while in Italy of junking all photoflood lamps at noon each day and replacing them with new ones. Thus, while the junked lamps had not been in use the full six hours, the danger of "blowouts" was eliminated and a better quality of lighting was assured by using fresh lamps.

Oddly enough, the junked lamps could not really be junked or disposed of but had to be accounted for at the customs office at time of departure. This created the problem of transporting out of the country a lot of useless lamps that could not be disposed of until Daniels and his crew returned to America. "It was as though Italy told us we couldn't dump our trash in her back yard," said Daniels. Actually there was more to it than that. "Italy's present customs laws are pretty tough," Daniels continued. "You can bring plenty of stuff into the country but you have to pay duty on it to take it out again! The mandate that made it necessary for us to account for every photoflood lamp, burned out or otherwise, was in line with the country's regulations to curb black marketing. We were obliged to account for every burned out or discarded bulb and every foot of 'short-ends' of film, and take them out of the country with us when we left!"

Actually, of course, this imposed no difficulty on Daniels or his crew. He cited these experiences merely as sidelights on the European scene where conditions are changing rapidly. He was happy that the lighting problem, always an unknown factor in overseas shooting, had been so successfully met by use of photoflood lamps and light, portable equipment. It sets a precedent which is likely to be followed by other Hollywood producers planning productions in European countries.

Judging of Contest Films Begins

AMATEUR movie makers planning to enter films in the American Cinematographer's 1950 Amateur Motion Picture Competition, may now submit their films for entry and evaluation. Entry blanks, together with the $1.00 entry fee, should be mailed separately and in advance of films to the Contest Editor, American Cinematographer, 1782 No. Orange Drive, Hollywood, 28, Calif.

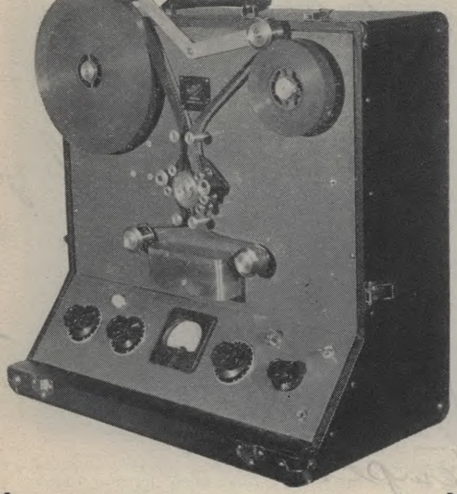
Please remember the limits that apply to all contest films: 16mm. films should not exceed 800 feet in length, and 8mm. films should not be over 400 feet in length. Both the film reel and its container should bear the name and address of the entrant. Films should be shipped prepaid. They will be returned to the entrant Express collect, fully insured. Safe return of films is thus assured.

The contest judges wish to reassure every entrant that his films will receive the very best of care in their hands. Only experienced operators will be in charge of the projectors and sound equipment, thus insuring not only the best presentation of films on the screen, but that films will not become damaged in any way through handling.

American Cinematographer's 1950 Amateur Motion Picture Competition, sponsored jointly by AC and the American Society of Cinematographers, affords the American cine amateur the opportunity to display his cinematographic skill before the professional cameramen of Hollywood.

The panel of judges, comprising six prominent members of the A.S.C., is well qualified to evaluate the contest films by virtue not only of vast professional experience, but because each judge is also a cine camera enthusiast in his own right and thus is conversant with the limitations, problems, etc., encountered by the amateur in producing 8mm. and 16mm. movies.

They await with considerable enthusiasm the opportunity to screen the contest films and to choose the winners of the handsome trophy that is the American Cinematographer Award, and the six Achievement Awards for cinematography.



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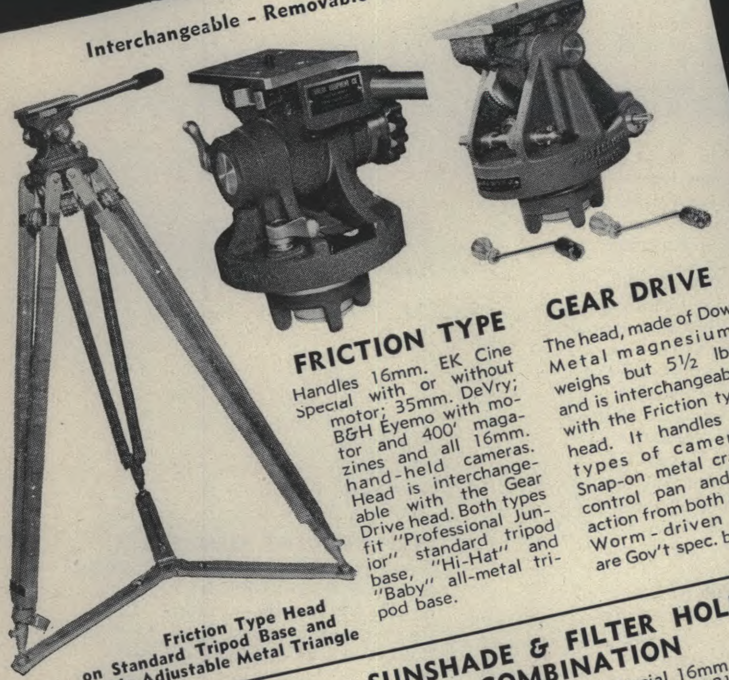

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Handles 16mm. EK Cine Special with or without motor; 35mm. DeVry; B&H Eyemo with motor and 400′ magazines and all 16mm. hand-held cameras. Head is interchangeable with the Gear Drive head. Both types fit "Professional Junior" standard tripod base, "Hi-Hat" and "Baby" all-metal tripod base.

GEAR DRIVE

The head, made of Dow Metal magnesium, weighs but 5½ lbs. and is interchangeable with the Friction type head. It handles all types of cameras. Snap-on metal cranks control pan and tilt action from both sides. Worm - driven gears are Gov't spec. bronze.

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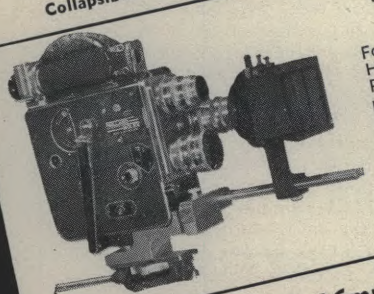

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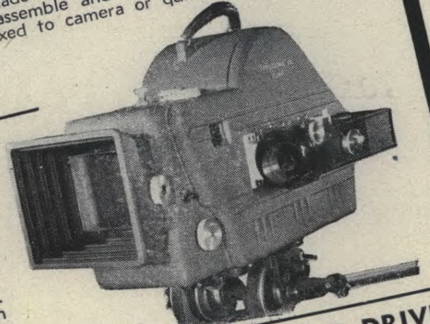

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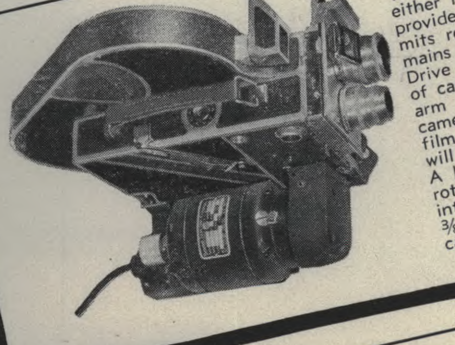

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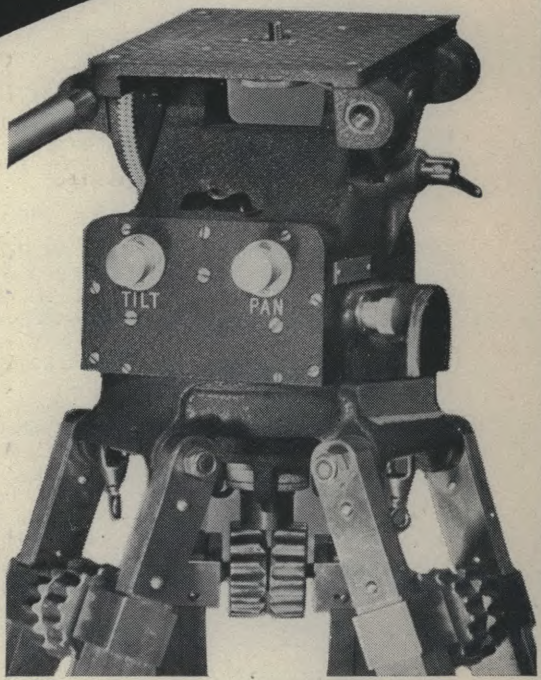

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LIGHTING FOR COLOR MOVIES

(Continued from Page 16)

Color films available to the amateur fall into three categories: Daylight (balanced for average outdoor light), Type A (balanced for photoflood light of about 3400° Kelvin), and Type B (balanced for tungsten light of about 3200° Kelvin). When used with its own type of light under ordinary conditions, each of these films theoretically records a natural quality of color rendition. However, there are several important variables which can change the color quality of the light.

For example, time of day is most important in color filming outdoors. In the early morning hours of an overcast day, there is an abundance of ultra-violet in the atmosphere which records as an exaggerated blue cast on color film. Similarly, in the late afternoon hours of an average bright day, when the sun is close to the horizon, there exists an abundance of red rays which are readily recorded, especially over flesh tones. The rulebooks for amateur movie makers say that for most consistent color quality, filming should be done anywhere from two hours after sunrise to two hours before sunset —or to be on the safe side, from about 10. A.M. to 3 P.M., depending upon the season of the year. Thanks to the development of color temperature meters and color correcting filter kits, it is no longer necessary to stay within these limitations. By taking careful color temperature readings and compensating with the correct filters as the day progresses, the cameraman shooting in color can now lengthen his shooting day by as much as three or four hours.

When filming in color out-of-doors it is almost impossible to maintain a consistent light quality when separate scenes of a sequence are shot on different days, in different locales, or under varying weather conditions. The only recourse for the cameraman is careful planning and organization that will enable him to shoot all of his key scenes in the one session. This applies mainly to the long shots, especially those showing sky. If these can be shot in a group so that they are all consistent, the closer shots can be made later, since there is usually sufficient compositional change from a long shot to a close-up to camouflage any variation in light quality.

Indoor filming in color presents its own set of advantages and complications for the photographer. The main advantage is that the light can be controlled. Also, the same lighting setup can be duplicated from day to day without variation. But here again there are several points which must be considered. First, the film should be matched to the type of lighting which is to be used. Second, great care must be taken to see that outdoor light does not mix with the interior lighting—or that should this be necessary, proper compensations be made.

It is well to remember, too, that the latitude of color filming is a good deal less than that of black and white, and it is therefore easier to under-expose or over-expose. For this reason, meter readings should be taken carefully and accurately. In a scene including people, the flesh tones will naturally reflect the most light. Therefore, the basic light reading should be made for these flesh tones and the other lights in the scene balanced accordingly.

Up until recently, manufacturers of color film as well as leading authorities on the subject, recommended flat lighting for color, since this seemed to be a fool-proof method for achieving a consistent, acceptable result. This point of view has now been somewhat altered, and the more capable color cameramen are using greater lighting ratios in order to produce a more pleasant modelling and separation for the subjects. It can safely be said that consistently good results can be achieved in color if the lighting ratio is one to two or one to three (between key light and fill light). Occasionally, for special effect, it is possible to use much greater ratios, but in such cases one must expect excessive contrast.

In color filming, colored light also can play a dramatic part. It is useful not only in creating realistic light quality for special situations (such as fire light, moonlight, sunsets, etc.), but also in the creation of certain special effects. Very often a drab subject can be greatly enlivened through the use of colored light, even though careful analysis might prove that such lighting was not strictly motivated. In such a case, artistic license permits the cameraman to use such lighting (providing it is not overdone), purely for the sake of pictorial effect.

Lighting for color is a science in itself. The fundamental principles can be learned from texts and technical articles, but the best way to achieve finesse in lighting for color movies is to try out various effects "on the set." Certain rules should be followed at first, but as in every art medium, it is sometimes possible to throw all of the rules out the window and still achieve an original and pleasing result.

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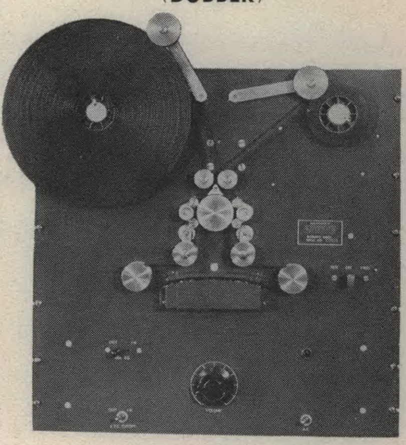

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CARBON ARC LIGHTING

(Continued from Page 11)

lamp houses by suitable acoustic material have resulted in the low noise level of today.

After these improvements had been made in spot lamps and spot lamp carbons, it was found by comparison that the light from the broad-side lamp needed some improvement. Mole-Richardson developed the familiar Duarc lamp in 1938 which included an efficient reflector and smooth, automatic carbon feed. Simultaneously with this lamp development we worked on carbons to operate most favorably with this new lamp mechanism and which would give the desired color of light. After an intensive development program, we were able to produce a trim of carbons which gives a flickerless light and could be used for colored photography without filters.

During this time, technological progress in background projection had made its use widespread. The demand for the illumination of larger screens, particularly for color, made the need for more powerful background projectors imperative. As a result of these demands and the standardization work of the Academy of Motion Picture Arts and Sciences, Mole-Richardson developed the type 250 background projection lamp. This lamp with its water-cooling, automatic control and other features made it possible to use higher currents than hitherto customary. Considerable experimental work was carried out on various carbons and the optical systems including the relay condenser system. This resulted in the development of a 16mm. carbon for operation at 225 amperes. These new carbons combined with the new lamps and optical systems, along with the development of multiple head background projectors, all served to remove a serious limitation on the use of background projection in color.

The continuing experiences of cinematographers with the available spot lamps showed the need for still more powerful ones. In response to this demand Mole-Richardson developed the type 450 "Brute" lamp. These lamps were designed to use the 16mm. carbon trim at 225 amperes. The usage of this trim in spot lamps put more severe demands on the carbons than was hitherto the case with the water-cooled rear projection lamp. The requirements were for a carbon trim that would burn quietly and steadily and have ample overload capacity. In order to obtain quiet operation from the time of striking the arc, it was necessary to develop a new negative carbon. This, along with a modification of the positive carbon has provided a satisfactory combination for these lamps.

The result of these developments over the past decade or so is that it has given us a well rounded group of lamps and coordinated carbons which produce highly successful results. It is perhaps well for us at this stage to stop and take stock, reviewing the attributes and advantages of carbon arc light.

1. *Wide range of types and sizes of lamp units.* These range from the 7500 lumen output of light well diffused for broadside illumination from the Duarc lamp through the type 90 and the type 170 spot lamps on up to the type 450 spot lamp with its maximum of a quarter million lumens output.

2. *Very powerful units.* The usage of powerful lamps such as the type 450 "Brute" makes it possible to illuminate large sets with reasonable numbers of lamp units and obtain desirable modeling effects and directional control over the lighting.

3. *The color of the light is best suited to the requirements of color photography.* The color has a desirable daylight quality and there is no need for any mental compensation to allow for visual color distortion in order to anticipate the end photographic result. The essentially continuous radiation spectrum of carbon arcs very effectively furnishes all wavelengths important photographically.

4. *The lamps have a fixed output.* The light output and its color remain constant throughout the life of a trim and from one trim to another.

5. *Fixed life.* At any given condition of operation carbon electrodes have a definite predictable life and you know just how long they will last.

6. *Known costs.* Due to definite life and other factors the operating cost can be reduced to definite tangible figures.

7. *Carbon arcs are of proven dependability.* There is no doubt about the light being available when it is wanted.

8. *Immediate availability.* The light from carbon arc lamps is instantly available without any need for warm-up, ovens, simmering current, etc.

9. *Basic simplicity.* A carbon arc source is fundamentally a very simple device. All that is required is that two electrodes connected to a proper source of electric power be touched, separated and then held a fixed distance apart.

10. *Instant accessibility.* Lamps can be examined and serviced immediately after shutting them off. There is never any need to defer examination of lamps until after they have been taken to a shop.

11. *Carbon arc lamps are safe.* Since they operate at normal atmospheric pressure no undue precaution need be taken. Also, all voltages are in the range ordinarily accommodated without special provisions.

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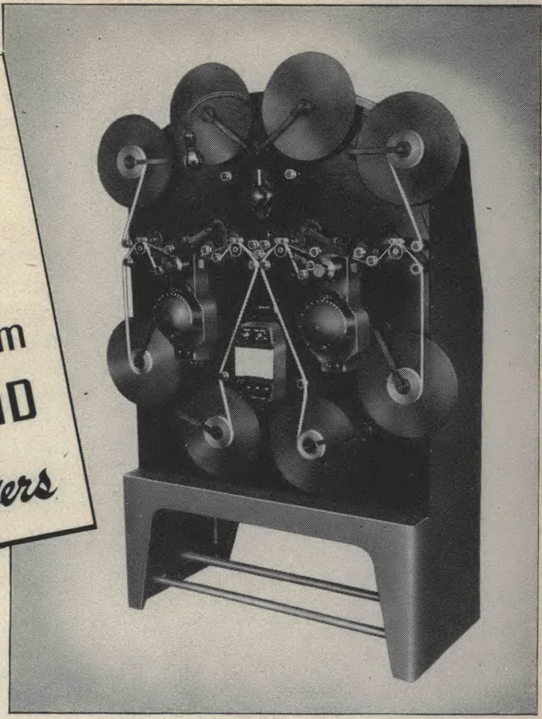

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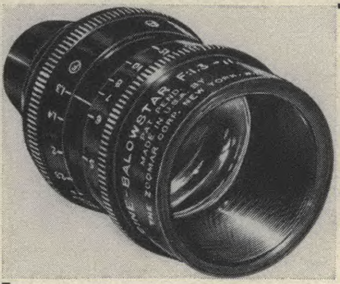

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predict the course of future developments in carbon arc lighting. However, we can outline the direction of some of our experiments, our thinking and experience in other fields. Of course, just how much will be applied to any given field will depend upon the needs of that field, new developments, etc.

During the past decade we have done a large amount of experimentation with water-cooling of carbons, particularly as applied to specially designed carbons. We have found with carbons of suitable composition and construction that water-cooling properly applied increases the ceiling on operating current and brightness. For example, 13.6mm. diameter carbons can be operated at as high as 300 amperes giving a crater brightness of more than 1600 candlepower per square millimeter which is equivalent to the apparent brightness of the sun. Other carbons have been operated at a brightness of over 2000 candlepower per square millimeter. Carbons presently used for studio lighting in general do not much exceed 900 candlepower per square millimeter brightness. The higher brightness of these newer carbons may find application where very intense beams must be projected.

It has been demonstrated that "flame swallowers" can be used to control the positive tail flame and the products of combustion of the arc. A negative carbon in the form of a circular disc has been used abroad to obtain long burning life in small physical space. Air-blown arcs have been studied for special applications. Whereas these things may have been originally studied for application in other fields such as searchlights and motion picture projection, they are being scrutinized for studio applications.

Last year we carried out some experimental tests in Hollywood on 16mm. carbons burned at 500 amperes to produce at least twice as much light as the present maximum of the 225 ampere 16mm. carbon used in the type 450 "Brute" spot lamp. Considerable numbers of searchlights were used in Europe during the war at very high currents, some of these ranging up to 1000 and 1200 amperes. Work was carried out here and also abroad on arcs at even higher currents for searchlights. These operated in some instances at currents as high as 4000 amperes. It is theoretically possible to generate all of the light needed for a large set with a few very powerful units. There would, of course, be problems of control and distribution of the light, getting it to the right places on the set. Perhaps we could turn back towards very early practices in motion pictures lighting where the light from the sun was used and directed into various parts of the set by means of suitably placed reflectors. There would, however be one important difference. The light source instead of being the sun with all of its uncontrollable featuers caused by atmospheric and astronomical variables would be carbon arc lamps generating controllable and reproducible amounts of light of constant color.

Our laboratories are continuing their work with modern and improved equipment and are finding new and better ways of fabricating new and better carbons.

The final thought I wish to leave with you is that working together we have come a long way and by working together we can go a lot further. We are dependent upon men such as you to help guide us in the direction our developments should take by pointing out to us your needs, both to carry out your day-to-day tasks and also to pioneer new procedures and techniques.

NOTE: The foregoing is text of a technical address given before members of the American Society of Cinematographers recently by Mr. Lozier, the author.

THE PRODUCTION OF FILMS FOR TELEVISION

(Continued from Page 12)

driven with synchronous or interlock motors.

At the present time, the best picture and sound quality is obtained when 35mm. film and equipment are used throughout the process. The use of 16mm. film, with its smaller dimensions, imposes more severe restrictions on equipment as well as on the film characteristics and processing requirements. Certain bottlenecks have been created in the 16mm. program, which will be discussed in a later section, which are largely responsible for the difference in the quality of results obtained.

Composition—In the series of steps employed in the reproduction of a film image on a receiver screen there is inevitably a certain amount of cropping of the picture area. Some of this occurs in making the print, some in transferring the image to the television mosaic and some at the receiver screen. In the latter case, variations in design of the mask (screen opening) for various types of receivers may result in some vignetting. Receivers which permit some adjustment in the image magnification may also cause vignetting, depending on individual tastes in monitoring. There is some justification, therefore, in confining the subject material and signifiicant action to a camera finder area which is somewhat smaller than that used in making films for normal projection use. Under these circumstances, all important information would then be seen on the majority of commercial receivers. Thus far, no standard has been established to specify the exact camera action field for television studio photography. One television station has reported that this camera action field should be about 8½ per cent less for the top and bottom margins and about 13 per cent less for the horizontal margins as compared with the standard camera finder area.

Subject matter should be photographed as large as possible but should not unduly crowd action and movement of the characters. The most pleasant reproduction on the receiver screen is obtained from close-ups and they should therefore be used as frequently as possible. Medium shots give just acceptable reproduction while long shots give rather poor reproduction. It is necessary, of course, to include some long shots in order to obtain the essential continuity in terms of transition, location, and dramatic telling of the story. Furthermore, the inclusion of long shots gives the psychological effect of making the observer believe that the definition is better than reality would warrant, an effect known as apparent definition.

The need for numerous close-ups is emphasized if one constantly visualizes reproduction in terms of the small viewing screen. On the average, most receivers at present are equipped with rather small screens as compared with screens commonly used for projection of home movies. The range of brightness which can be reproduced as satisfactory tone scale values is also much less than is the case for home movies. The producer should strive, therefore, to avoid the so-called "tunnel-viewing" effect and earnestly try to carry the viewer into the picture.

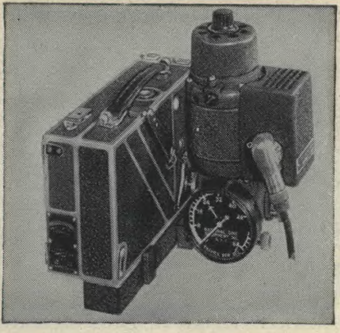
Sets and Properties — On the average, sets may be smaller than those used for conventional motion picture production because of the need for many close-ups and the preservation of some background detail. Fine or delicate detail in backgrounds, clothing, furniture, accessories and all properties, should be avoided. Instead, large patterns (checkerboard designs and the like) with sharp changes in contrast should be used, and of such a size that they will be definitely visible on the television receiver screen. Large, uniformly colored areas, should also be avoided, especially when they occur in the foreground of the picture. Such areas should, instead, have large-pattern design. This is necessary in order to produce a print with large variations in density, which in turn will reduce the "horizontal smear effect" frequently observed on the television viewing screen.

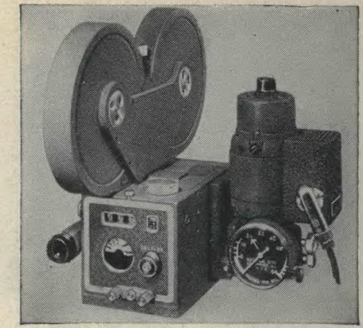
General Photography—In general, camera takes employing zooming, travelling, and panning should be done at a lower rate of speed than is often customary in motion picture production. If this precaution is not observed, geometrical distortion in the receiver-tube image will occur. When it is desired to show transition of space and time, the accepted lap dissolves, quick fades, instantaneous "cuts," etc., are fully satisfactory. Long fades are undesirable since they may give the viewer a mistaken impression that the receiver is not functioning properly.

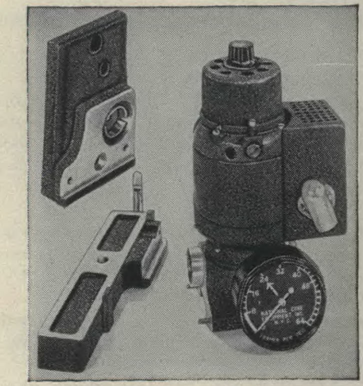
From previous remarks it is also obvious that all main and insert titles should be made with larger and bolder lettering than is normally used for motion picture titles. The backgrounds should not be of uniform tone or color but should have coarse and large pattern texture to produce varying contrast. Black backgrounds should not be used because of the excessive edge-flare effect discussed in a later paragraph. Shading of the letters, decreasing in density toward the right, is also desirable in order to reduce the horizontal smear effect. Titles should be centered and care should be exercised to see that they do not extend to the extreme edges of the frame area, since they may be partially cut off in the receiver tube image due to the vignetting discussed previously.

Subject Lighting—The most notable departure from standard motion picture technique in making films for television use is that relating to the subject lighting contrast which is required. The limited range of brightnesses which can be reproduced as satisfactory tone scale values in the television system imposes restrictions on the range of brightnesses which can be effectively reproduced on a receiver screen from a subject being televised. Since in the case of film telecasting, the subject is an image on film, this means that the density range must not exceed a certain value if good tone reproduction is to be obtained in both highlights and shadows.

The effective brightness range of present television systems is not more than 1 to 30 in a closed circuit, when the complete television system is functioning at its highest efficiency under the supervision of trained personnel. This is equivalent to saying that highlight details in a picture which are more than 30 times the brightness of visible shadow detail will not be seen on the receiver screen. Limited measurements indicate that average individual adjustments of commercial and home television receivers provide an effective brightness range of only 1 to 20







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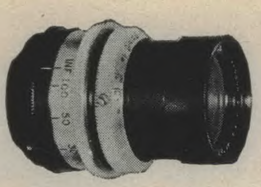

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or less. With the best adjustment this is not over 1 to 25 because of transmission losses. Further measurements in the future may show that these values are too conservative and should be even lower. It is also possible that the value is influenced somewhat by the type of subject matter.

Let us compare this brightness range with that obtained on a Class A motion picture theater screen. A modern theater projection system in good operating condition, equipped with a surface-treated lens and providing a screen brightness of about 10 foot-lamberts, gives a screen brightness range of 1 to 40. This is double the range of the average television receiver, accounting for both a greater apparent image definition and a much greater range in tone reproduction. This means that more delicate highlight tones and greater shadow detail are distinguishable on the motion picture screen than on the television screen.

The television screen in the home may also be illuminated at night by room lights or by day by stray light from windows. Such general screen illumination still further reduces the brightness range as compared to the theater where ambient light is strictly controlled and minimized.

This difference also means that a motion picture print which is to be televised should have a lower density range than one which is intended for normal projection use. In fact, since the brightness range for the motion picture screen and that for the television screen differ by a factor of 2, this indicates that the density range of the print for television use should be lower by an amount equal to the logarithm of 2, or 0.3. Thus a print from a certain negative of 2.00, should have a density range of only 1.70 or less, in case the print is intended for television use. The exact density range will vary somewhat, of course, depending on the nature of the particular subject or scene.

(To Be Continued Next Month)

NEW 16MM. SOUND TRACK

(Continued from Page 14)

greater number of sections. This involved certain disadvantages, notably a reduction in the amount of noise reduction that could be employed with good results.

The new multiple track may well exert a considerable influence in the industry, particularly in respect to the use of 16mm. for television release. In some cases, the decision to incur the additional costs of 35mm. production may have been based on an unfortunate comparison between the results given by 16mm. versus 35mm. projectors. This new aid to the improvement of 16mm. sound quality will be a strong influence in the decision to use the less expensive medium. Most television projectors, being rather slightly modified standard 16mm. equipment, will obtain the full effect of the improvement. Certainly the telecasting of more uniform high quality in 16mm. prints will be welcomed by viewers and thus make the filmed material more acceptable to stations and sponsors alike.

The Maurer company has announced that the new multiple sound track will be made available as a conversion to present owners of the latest type Maurer recording systems and that very soon, all new Maurer recorders will be equipped to provide the improved multiple sound track as standard equipment.

COLOR TEMPERATURE

(Continued from Page 13)

3000°K. But that same accuracy would be plus or minus 5000°K at 20,000°K. Incidentally, it may be that those producers of color temp. meters who casually give an accuracy rating of say plus or minus 25°K for their meter, without specifying the color temp. level, do not completely understand the subject with which they are attempting to deal.

In any event, the above weakness in the Kelvin scale is caused by the fact that it is not a uniform scale. The divisions are crowded together at one end of the scale and widely separated at the other end. This weakness has been recognized by scientists. As a result a better type of scale was set forth by I. G. Priest (a U.S. Bureau of Standards man) in about 1933. That scale was divided into Mireds (micro-reciprocal-degrees).

A Mired scale is shown in Fig. 1. Relative corresponding values on the Kelvin and Mired scales may be noted on the chart. For example, 10 Mireds correspond to 100,000°K, and 400 Mireds correspond to 2500°K, etc. The chart also shows the Mired values for various types of light sources.

Several advantages appear to be inherent in the Mired scale. For one thing it deals with relatively small figures. These are easy to read on a meter scale, easy to write, and easy to remember. The scale is a uniform scale. Divisions are equally spaced. Hence a given color difference will always be designated by the same number of Mireds, wherever it lies along the scale. A light blue filter of say 25 Mireds value will always have a 25 Mireds value whether it is used at a level of 100 Mireds or a level of 400 Mireds. This feature makes the Mired scale of considerable value in color photography, where filters are used for color temperature correction.

Color temperature filters can be directly designated in terms of Mireds. They will then fulfill a definite and easily understood function in regard to changing the color temperature. A given filter will always change the color temperature of the illumination by a fixed number of Mireds. For example, if the color temperature of the illumination is 195 Mireds, and the color film in the camera is balanced for 170 Mireds, it is only necessary to use a 25 Mired blue filter to cause the proper change in the illumination color.

A color photographer who wishes to make use of color temperature filters will probably find that a first class color temperature meter is of considerable value. The meter may be used to measure the color temperature of the illumination. Then an appropriate C-T (color-temperature) filter may be selected for use.

I have recently developed a C-T meter which seems ideal for all photographic purposes. (See Fig. 2.) The meter has a number of desirable features. Among them is a provision for instantly interchangeable scale plates. The scale plate fits around the periphery of the meter, as may be noted in the illustration. For some purposes a photographer may prefer to use a Kelvin scale, as shown in Fig. 1. For other purposes he may desire to use a Mired scale, also shown in Fig. 1. Either are instantly available with this meter.

I have found that a third type of scale can be very useful for color photography. This type of scale is a color temperature filter scale. An example is shown at the right in Fig. 1. The scale is made up to be used with a particular type of color film, such as daylight film, or photoflood type film, or tungsten projection lamp type film.

A C-T filter scale to match the type of film in the camera may be snapped into place on the meter. The meter may then be used to evaluate the prevailing illumination. The answer will be given by a direct indication of the filter necessary to balance the light which reaches the film.

Should the prevailing light be naturally correct for the film, the meter index will indicate 0—the ideal light condition in which no filter is needed. Should the light be unbalanced and somewhat strong in the blue, the index may indicate one of the R (for red) filters. The filters noted on the scale are 25R, for red by 25 Mireds; 65R, for red by 65 Mireds; and 125R, for red by 125 Mireds.

Conversely, should the illumination be unbalanced, and strong in the red, the meter would indicate one of the blue filters such as 25B or 65B or 125B.

A set of six C-T filters, as shown on the scale plate, will go a long way toward giving a photographer appropriate

(Continued on Page 33)

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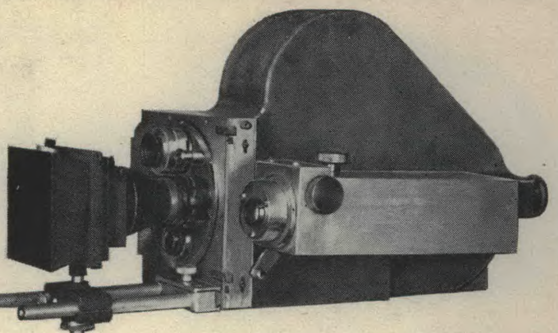

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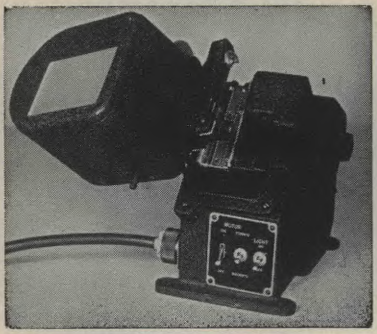

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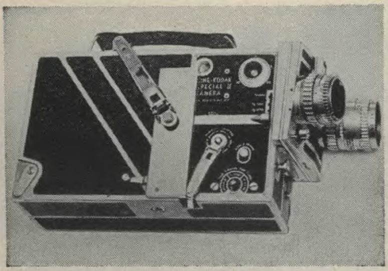

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Current Assignments of A.S.C. Members

Major film productions on which members of the American Society of Cinematographers were engaged as directors of photography during the past month.

Columbia

• Joseph Biroc, "The Killer That Stalked New York," with Evelyn Keyes, Charles Korvin, William Bishop, Lola Albright and Barry Kelley. Earl McEvoy, director.

• Phillip Tannura, "Custom's Agent," with William Eythe and Marjorie Reynolds. Seymour Friedman, director.

• Ira Morgan, "State Penitentiary," with Warner Baxter and Karin Booth. Lew Landers, director.

• Burnett Guffey, "No Way Out," with Glenn Ford, Broderick Crawford and Carl Banton Reid. Henry Levin, director.

Eagle-Lion

• Lionel Lindon, "Destination Moon," (George Pal Prod.) with Warner Anderson, John Archer, Erin O'Brien Moore and Tom Powers. Irving Pichel, director.

Independent

• Hal Mohr, "Here Lies Love," (Briskin-Smith Prod.) with Robert Young, Betsy Drake, John Sutton and Jean Rogers. James V. Kern, director.

• Jackson J. Rose, "Destination Murder," (Prominent Pictures) with Joyce MacKenzie, Stanley Clements, Hurd Hatfield, Albert Dekker and Myrna Dell. Edward L. Cahn, director.

Lippert

• Benjamin Kline, "Everybody's Dancin'," with Spade Cooley, Richard Lane and Ginny Jackson. Will Jason, director.

M-G-M

• Joseph Ruttenberg, "The Miniver Sequel (In Color—shooting in England), with Greer Garson, Walter Pidgeon, John Hodiak and Cathy O'Donnell. Henry Potter, director.

• Robert Surtees, "King Solomon's Mines," (Technicolor) (Shooting in Belgian Congo) with Deborah Kerr, Stuart Granger and Richard Carlson. Compton Bennet, director.

• Charles Schoenbaum, "Duchess Of Idaho," (Technicolor) with Esther Williams, Van Johnson, John Lund and Paula Raymond. Robert Leonard, director.

• Charles Rosher, "Annie Get Your Gun," (Technicolor) with Betty Hutton, Howard Keel, Louis Calhern, J. Carrol Naish, Edward Arnold, Keenan Wynn and Benay Venuta. George Sidney, director.

• Harold Rossen, "Asphalt Jungle," with Sterling Hayden, Jean Hagen and James Mitchell. John Huston, director.

• John Alton, "Mystery Street," with Ricardo Montalban, Sally Forrest, Bruce Bennett and Marshall Thompson. John Sturges, director.

• Harold Lipstein, "The Skipper Surprised His Wife," with Robert Walker, Joan Leslie, Edward Arnold, Spring Byington and Leon Ames. Elliott Nugent, director.

• Robert Planck, "Summer Stock," (Technicolor) with Judy Garland, Gene Kelly, Gloria DeHaven, Phil Silvers and Eddie Bracken. Charles Walters, director.

• Harry Jackson, "Three Little Words," (Technicolor) with Fred Astair, Red Skelton, Vera Ellen, Arlene Dahl, and Keenan Wynn. Richard Thorpe, director.

• William Skall, "Kim," (Technicolor—Shoting in India) with Errol Flynn, Dean Stockwell and Paul Lukas. Victor Saville, director.

Monogram

• Marcel LePicard, "Blonde Dynamite," with Leo Gorcy, Huntz Hall, Adele Jergens, Bernard Gorcey and Harry Lewis. William Beaudine, director.

Paramount

• William Mellor, "A Place In The Sun," with Elizabeth Taylor, Montgomery Clift and Shelly Winters. George Stevens, director.

• George Barnes, "Mr. Music," with Bing Crosby, Charles Coburn, Ruth Hussey and Nancy Olson. Richard Hadyn, director.

• Charles Lang, "September," (Hal Wallis Prod.) with Joan Fontaine, Joseph Cotten, Francoise Rosay and Robt. Arthur. William Dieterle, director.

• Victor Milner, "The Furies," (Hal Wallis Prod.) with Barbara Stanwyck, Wendell Corey, Walter Huston. Anthony Mann, director.

R.K.O.

• Leo Tover, "Blind Spot," (Skirball-Manning Prod.) with Claudette Colbert, Robert Ryan and Jane Cowl. Mel Ferrer, director.

• Harry Stradling, "Edge Of Doom," (Goldwyn Prod.) with Dana Andrews, Farley Granger, Joan Evans. Mark Robson, director.

• Winton Hoch, "Jet Pilot," (Technicolor) with John Wayne and Janet Leigh. Josef Von Sternberg, director.

• Harry Wild, "Sons Of The Musketeers," with Cornel Wilde, Maureen O'Hara, Alan Hale, Jr. Lewis Allen, director.

20th Century-Fox

• Leon Shamroy, "Cheaper By The Dozen," (Technicolor) with Jeanne Crain, Clifton Webb, Myrna Loy, Betty Lynn. Sara Allgood. Walter Lang, director.

• Milton Krasner, "No Way Out," with Richard Widmark, Linda Darnell, Stephen McNally and Fred O'Neal. Joseph Mankiewicz, director.

• Arthur Arling, "My Blue Heaven," with Dan Dailey, Betty Grable and David Wayne. Henry Koster, director.

• Joe MacDonald, "Outbreak," with Richard Widmark, Paul Douglas, and Barbara Bel Geddes. Elia Kazan, director.

United Artists

• Stanley Cortez, "Once Over Lightly," (Roxbury Prodn.) with Edmond O'Brien, Wanda Hendrix, Rudy Valee and Steve Brody. Albert Rogell, director.

Universal-International

• Maury Gertzman, "Death On A Side

Street," with James Mason, Marta Toren and Dan Duryea. Hugo Fregonese, director.

Warner Brothers

- Ted McCord, "The Victim," with Joan Crawford, David Brian and Steve Cochrane. Vincent Sherman, director.
- Ernest Haller, "The Hawk And The Arrow," with Burt Lancaster, Virginia Mayo and Frank Allenby. Tourneur, director.
- Robert Burks, "The Glass Menagerie," with Gertrude Lawrence, Jane Wyman, Kirk Douglas, Arthur Kennedy. Irving Rapper, director.
- Carl Guthrie, "Storm Center," with Ginger Rogers, Ronald Reagan and Doris Day. Stuart Heisler, director.
- Wilfrid Kline, "Colt .45," (Technicolor) with Randolph Scott and Zachary Scott. Edward Marin, director.
- Karl Freund, "Bright Leaf," with Gary Cooper, Jack Carson, Lauren Bacall, Patricia Neal, Donald Crisp, Elizabeth Patterson and Jeff Corey. Michael Curtiz, director.
- Peverell Marley, "Pretty Baby," with Dennis Morgan, Zachary Scott, Betsy Drake and Edmund Gwenn. Bretaigne Windust, director.

Winterizing Cine Cameras

Eastman Kodak Company brings much valuable information for the cine cameraist in a new booklet off the press this month titled "Wintertime Picture Making," available at your camera store for 25 cents.

"If you are going to be taking pictures at sub-zero temperatures for a number of months, and know that you will not be using your camera indoors during this period, you should consider having your camera winterized," the booklet points out. "When you winterize your car, you remove the summer oils and greases and put in some which will flow readily at low temperatures.

"In winterizing your camera, about the same is done except that, for very low temperatures, no lubricant is put in at all. Winterizing a camera requires complete dismantling and overhauling and is, therefore, a rather expensive service. However, some camera manufacturers will do this job for you if you find it is really necessary. You should bear in mind, however, that you cannot take pictures indoors or in warm weather with a winterized camera without damaging it and that you must, therefore, have the camera overhauled again and de-winterized before you use it to take pictures at normal temperatures."

The booklet cautions camera owners that under no circumstances should they try to oil their camera if it sticks in cold weather. Even one drop of oil or solvent working its way through the mechanism of the camera may cause the camera to stop altogether.

The booklet further explains how you can find out if your camera will operate satisfactorily in sub-zero weather by pretesting it in a frozen-food locker.

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Cine-Voice Agents

S.O.S. Cinema Supply Corpn., 602 W. 52nd St., N.Y., has been appointed one of the Eastern distributors for the new Auricon Cine-Voice 16mm. single system sound camera designed for amateur movie makers.

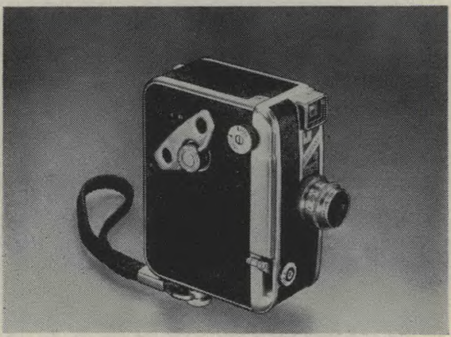
Patterned after the famous Auricon Pro camera, the mechanism is enclosed in a light, cast aluminum housing lined with sponge rubber, permitting making closeups at 3 feet without blimping camera. S.O.S. now has Cine-Pro cameras in stock for immmediate delivery, according to J. A. Tanney, pres.

Film On Volcano

Ralph E. Gray, who made the only complete 16mm. Kodachrome record of the birth and growth of the Mexican volcano, Paricutin, is now offering a specially edited version running 16 minutes on the screen. For price and complete description, write Mr. Gray at Postal Apto. 2747, Mexico City, Mexico.

New DeJur 8mm. Camera

DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City, N.Y., announces the latest addition to its line of 8mm. cine cameras—the Embassy—embodying such features as 6 speeds, including slow motion, magazine loading, 10-foot run on one winding and interchangeability of lenses. List price with f/2.5 lens is $99.50.



Diffusion Filters

Edward Garvin, 5028 Greenbush Ave., Sherman Oaks, Calif., offers specialized service in developing and manufacturing diffusion and special effects filters for studio camera departments and the individual cinematographers.

Kodak Book on TV Films

A new booklet describing the technique of most efficiently utilizing motion picture films in television is offered free by Eastman Kodak Company.

The publication is intended primarily for photographers and those concerned with the technical production aspects of lighting and filming sets for television films. It contains helpful charts and photographic illustrations and covers such topics as camera equipment, picture composition, sets and properties, effects and titles, etc. Titled "The Use Of Motion Picture Films In Television," copies may be obtained free by writing Motion Picture Film Dept., Eastman Kodak Co., Rochester.

Pollock Slide Viewer

Pollock Prods. Co., South Laguna, California, headed by Gordon Pollock, A.S.C., offers a novel viewer for 2 by 2 slides which features a radical new optical system that assures higher magnification and greater brilliance of the viewed slide image. Illumination source is a 7 watt bulb, using ordinary 110 volt current. A battery operated model is also available. List price is $19.95.

Optical Printing Service

Cinema Research Corp., 7000 Romaine, Hollywood, offers to American and Foreign film producers a wide range of services including dissolves, wipes, titles, animation, zooms, montages, matte shots, 16 to 35mm. blowups, 35 to 16mm. reductions, and 35mm. and 16mm. masters. Expertly staffed and boasting the finest equipment available, company regularly services independent film producers in both the 35mm. and 16mm. fields.

C-C Filter Announced

A new color correction filter, recommended for use in outdoor color photography when

(Continued on Next Page)

atmospheric conditions are unduly bluish, is announced by Eastman Kodak Company. The filter, known as the Kodak Skylight Filter, will be available in Series IV, V, VI, VII, and VIII Kodak Combination Lens Attachment Sizes as well as in 2-inch and 3-inch gelatin film squares. Use of filters will improve such shots as scenics where haze is present, beach and snow scenes and scenes in open shade lit by bluish sky light.

AN EXPERIMENT IN FILM TECHNIQUE

(Continued from Page 19)

camera. The camera—this was *our* main actor. And through the camera's eye we were brought out of the shadows, and it was "Out Of The Shadows" that became the title of our film theme.

As our film progressed and a climax approached, the tempo was increased in part by rushing the movement through cutting, and in part by incorporating swift montages made striking by the action of the dancers moving through the frame. It was the *camera* that enhanced nature. It was the *dancers* and the *location* that imitated it. Together, when all were in perfect union, we felt that we were approaching the theme and idea we had first intended to explore. Here was the summit of our Matterhorn, the center of our Africa. For here was what we had come for.

COLOR TEMPERATURE

(Continued from Page 29)

color temperature correction for most conditions.

In my work with color I have found that the direct filter type of scale, as shown at the right in Fig. 1, is by far the most useful. It is easy to use. The indications are significant and direct. Since the scale plates are easily interchangeable it is not necessary to crowd numerous confusing scales onto one scale plate. One clear, simple, easily read scale is selected and attached to the meter. This tends to prevent errors in reading.

The nomenclature for the C-T filters on the meter scale has a directly applicable significance for a color photographer. The readings mean that the color balance of the illumination is lacking in correct balance by a given number of Mireds (either red or blue). If a C-T filter, of the indicated color and number of Mireds, is attached to the camera lens the result will be correct illumination color balance for the film.

The use of this type of scale allows the photographer to make the necessary C-T corrections without diverting too much of his attention from other phases of his work, which seem to always contain plenty of other problems.

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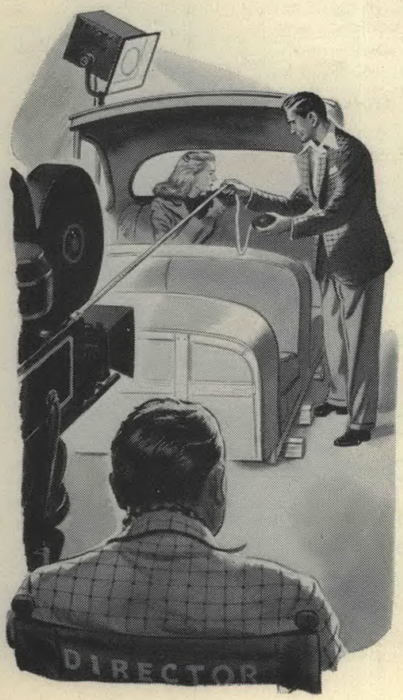

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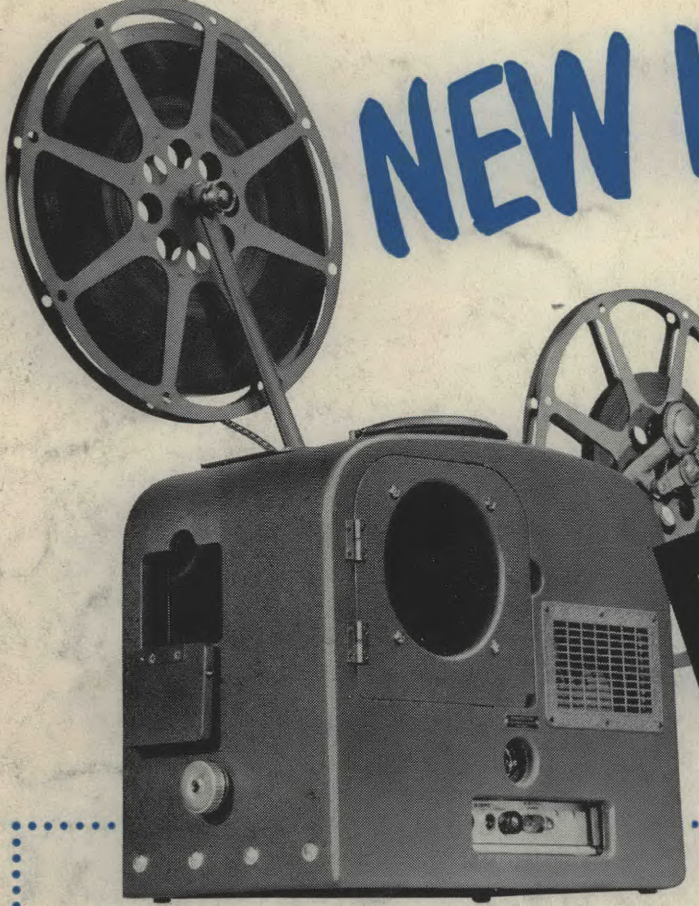

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